

The IRON AGE

December 18, 1958

A Chilton Publication

The National Metalworking Weekly



Harold B. Maynard:

**How to Bring
Indirect Labor Costs
Under Control P. 63**

**Why Michigan Industry
Looks Out of State — P. 49**

**Shot Blast Cleans
Multiple-Strand Rod — P. 89**

Digest of the Week — P. 2-3

ARISTOLOY

Electric Furnace Steels

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Describes melting, rolling, thermal treating and finishing capacity of Copperweld's Aristoloy Steel Division. Complete product listing for Aristoloy carbon, alloy, stainless, leaded and nitriding steels. Send for your copy today.

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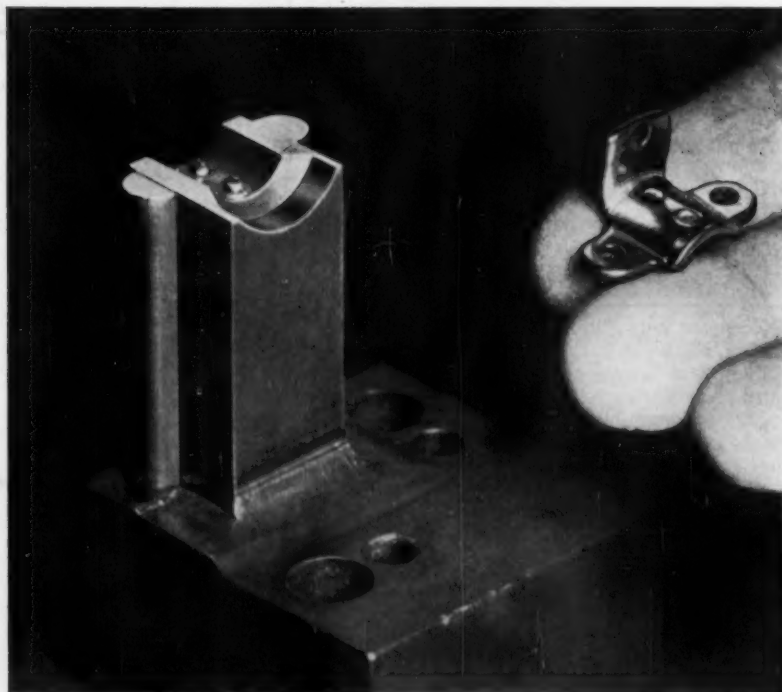
Tool Steel Topics



On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation

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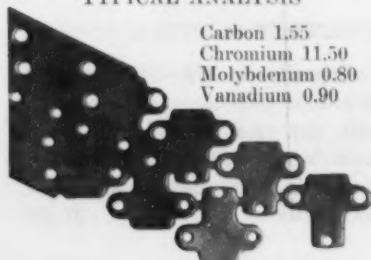


1½ million pieces with Lehigh H ...that's a long run in any league!

At Harvey Hubbell, Inc., Bridgeport, Conn., they were using a competitive grade of tool steel to form cord-clamp sections made from Grade 1010 steel strip. But each time they hit an average figure of 700,000 pieces, the die cracked, and had to be replaced. The manufacturer decided to call in Lindquist Steels Inc., a local distributor of Bethlehem tool steel.

TYPICAL ANALYSIS

Carbon 1.55
Chromium 11.50
Molybdenum 0.80
Vanadium 0.90



"With the finished part only .060 in. thick, we ought to do better than 700,000 pieces. What do you suggest?"

The distributor studied the operation, the cracked die, and the finished part. "I'd recommend Lehigh H," he said. "It has the strength you need in a forming operation of this sort." The Lehigh H was put on the job and produced 1½ million pieces without any trouble.

Lehigh H is our high-carbon, high-chromium, air-hardening tool steel. It's a grade with outstanding wear-resistance and toughness. And it's also a deep-hardening steel with high compressive strength.

The best way to evaluate Lehigh H is by putting it to work—not in an easy job, but in a tough one. Your Bethlehem tool steel distributor carries Lehigh H in stock, and will see that it's delivered promptly. Get in touch with him.

BETHLEHEM TOOL STEEL ENGINEER SAYS:



*Don't Use Fresh Water
For Quenching Tools*

Fresh water, regardless of its source, contains dissolved gases which make it unsuitable for quenching tools. When tools are quenched in fresh water, gas is liberated at the surface of the tool. Gas pockets thus formed may prevent contact between tool and water, resulting in soft spots from ineffective quenching. Soft spots are undesirable because of their low hardness, and also because a quench which produces them may also cause cracking of the tools.

Soft spots, and tool cracking associated with soft spots, can be avoided by quenching in water which has been previously boiled, to remove the dissolved gases. If water cannot be boiled, quench a large amount of hot "dummy" material to expel the gases. As a further precaution against soft spots, it is preferable to use a 10 per cent brine solution instead of water. It is also suggested that the dissolved gases be expelled from the brine solution before use.



USE DURAMOLD FOR COLD-HOBGING

Bethlehem's Duramold tool steels, in Grades A and B, are ideal for cold-hobbing plastic dies because they are free from injurious surface and internal defects. Duramold A, an air-hardening grade, is annealed to 109 max Brinell. Duramold B hardens in oil, and hobs more readily than Duramold A. It is annealed to 100 max Brinell, and has an addition of boron to increase the core strength.

THE IRON AGE
Chestnut and 56th Sts.
Philadelphia 39, Pa., SH 8-2000

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IRON AGE

December 18, 1958—Vol. 182, No. 25

Digest of the Week in

*Starred items are digested at right.

EDITORIAL

Business Gifts: Are They on the
Way Out? 7

NEWS OF INDUSTRY

*Special Report: Why Industry Is
Shunning Michigan 49
*How Much Will Linepipe Improve? 51
*Computers Are Paying Their Way 52
*Building Tops Aluminum Market 53
*Structurals Enter Era of Plenty 54
*Titanium Foil Arrives 56
The IRON AGE Salutes 59
*How to Bring Indirect Labor Costs
Under Control 63

FEATURE ARTICLES

*Shot Blasting Proves Practical in
High-Speed Rod Line 89
*How to Repair Alloy Chain Slings 92
*Nickel in High-Speed Tool Steels 94
Hose Makes Good Work Clamp 97
*Make Transfer Machines Do More .. 98
Automation in Batch Assembly 100
Less Handling Ups Forging Output. 102

NEWS ANALYSIS

Newsfront 9
Report to Management 61
*Automotive 67
Washington 71
*West Coast 73
*Machine Tool 75

MARKETS & PRICES

Market Planning Digest 47
*The IRON AGE Summary 121
*Purchasing 122
Steel Product Markets 124
Index to Prices 125
Iron and Steel Scrap Markets 126
Nonferrous Markets 130
Clearing House 140

REGULAR DEPARTMENTS

Letters 11
Fatigue Cracks 13
New Materials, Components 115
New Equipment 118

INDEX TO ADVERTISERS 146

NEWS ARTICLES

INDUSTRY IN MICHIGAN

Losing Its Grip—Michigan's reputation as an industrial leader is being challenged. Neighboring states are luring many new plants with lower taxes. P. 49

LINEPIPE SALES

After Memphis Overturn — It may take several months before the



Supreme Court reversal of the Memphis decision is reflected in linepipe orders. But mills believe '59 sales could hit '57's peak level. P. 51

COMPUTERS

Starting to Pay Off — Doubts about the economics of using computers for engineering jobs are lifting. They are proving themselves in design applications. P. 52

STRUCTURAL STEEL

Capacity Is Up—Shortages of structural steel are a thing of the past, say steel companies. Recent gains by concrete have steelmakers sharpening new research and engineering tools. P. 54

THE IRON AGE, December 18, 1958

Metalworking



RAMBLER EXPANDS

\$10 Million Program—To keep up with its steadily climbing sales curve, American Motors will add to its production lines. P. 67

MOLYBDENUM

Reduces Tool Chatter—Molybdenum supports can reduce cutting tool chatter up to 90 pct. Initial cost is offset by lower overall costs. P. 75

FEATURE ARTICLES

SHOT-BLASTING

Practical for Rods—Mechanical descaling proves to be the answer to the need for faster, more efficient output of high-speed rod lines. It takes the place of acid cleaning and thus eliminates the problem of waste-acid disposal. A four-wheel blast pattern gives complete coverage. P. 89

ALLOY SLING CHAINS

How to Make Safe Repairs—Field repairs on alloy sling chains can be made safely. But it's necessary to follow some basic rules to insure an assembly with the same safety and life expectancy of the original setup. P. 92

HIGH-SPEED TOOL STEELS

Nickel Question—Structural steels contain nickel for improved performance. Yet tool steels are rarely alloyed with nickel. Why? There seem to be two reasons. Annealing cycles won't work when

nickel content is appreciable and there's also a propensity for nickel steels to retain austenite. P. 94

NEW FEATURE

Design Digest—What's new in materials and components? Now, as a regular weekly feature, The IRON AGE brings you a new section. This week it starts on P. 115.

TRANSFER MACHINES

Make Them Do More—Starting with its highest-volume lines, spray guns, a firm sets up its transfer machines to take care of six different models. Quick changeover cuts processing costs 47 pct. P. 98

MARKETS & PRICES

ALUMINUM MARKETS

Building Is Tops—The latest report from the Aluminum Assn. indicates that building materials is still the major market. There were few changes in the overall picture this year. P. 53

NEXT WEEK

PRESET TOOLING

Cuts Die-Change Time—A sliding bolster press turns out almost the productive time of two conventional presses. Next week's feature tells how preset tooling slides into place to reduce die-change time on short run jobs substantially.

INDIRECT LABOR COSTS: Here is one of the last frontiers for cost reduction. Many managements have avoided indirect labor cost studies, says Consultant H. B. Maynard, because they are difficult to analyze. He shows that these studies are not as tough as some would believe.

P. 63

TITANIUM

Foil Coils—The aircraft industry wanted it, so Titanium Metals Corp. developed foil. They are now selling it, both commercially pure and alloy. P. 56

FARWEST STEEL IMPORTS

A Rising Tide—The West Coast steel market is made to order for importers. During first half of this year they increased their share in Farwest by 20 pct over the same period in 1957. P. 73

BIG PUSH COMING

Steel Order Backlogs Up—Steel market developments point toward a big push after the turn of the year. Both new orders and shipments are trending upward. P. 121

INVENTORY CONTROL

Data Processing Pays Off—Perfection Gear has been cited for the efficiency of its purchasing operation. One feature is the use of data processing machines for quick, accurate inventory control. P. 122





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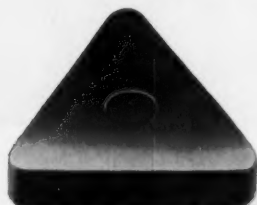
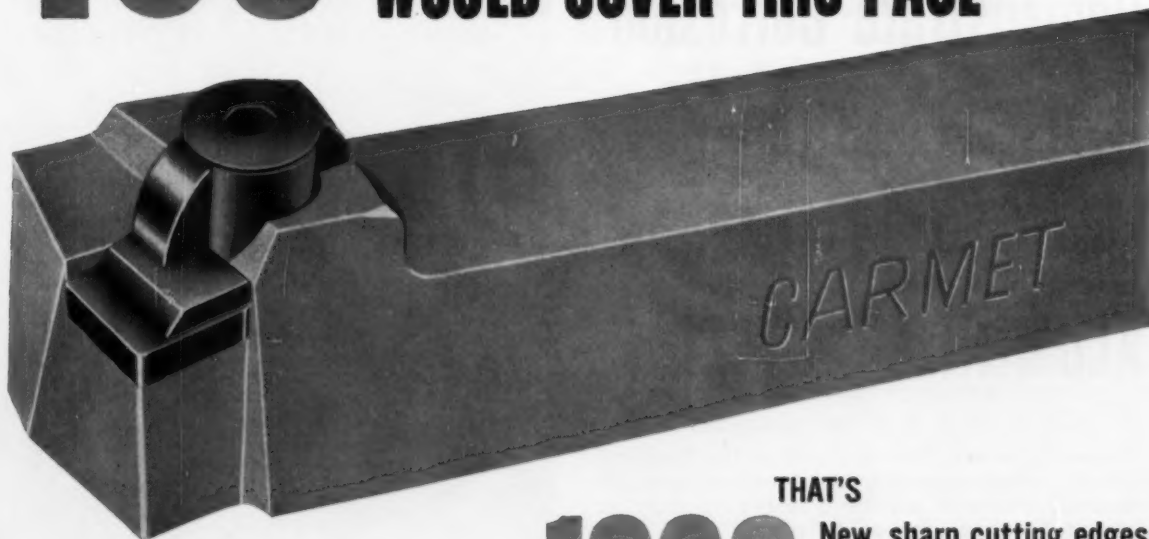


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Business Gifts: Are They on the Way Out?

Maybe this is the time to review commercial Christmas giving. We may come up with a better plan for next year.

Even in our deepest soul-searching it is too much to think this problem will ever be solved completely. But progress can be made.

Some say the pendulum is swinging away from lush and grandiose commercialization of Christmas. But this may be due to the recession and not to new-found discipline.

But there is evidence that the law of diminishing returns is being reached in business giving at Christmas. We have a long way to go, though, if we are to get back our sanity.

At times the gift tide borders on the ridiculous. Many don't do anything about it because of fear that others won't do likewise. This ostrich-like thinking often produces a commercialization of Christmas that is overdone, indelicate, expensive, and vulgar.

Christmas is Christ's birthday. It should be honored and observed as such. It is a season of rejoicing, humility, and hope. That allows plenty of leeway to do things—in and out of business—for those whom we know, respect, cherish, and love.

But to take this season as an occasion to launch into an unreasonable spending spree to impress impersonal contacts or customers leaves something to be desired. And here we do not refer to giving presents in a happy and orderly way—even to the extent of having our hearts rule our pocketbooks. Nor are we naively thinking that the millenium will be reached next year.

If a commercial gift doesn't stem from the "spirit of giving," it can't be anything else than an attempt to influence buying decisions or relationships. Assuming this is true, its value is greatly over-rated. It probably doesn't do a fraction of the things it is supposed to do.

Who remembers who gave him that gold tooth pick last year; or the coffee table; or the hi-fi. Hard to recall isn't it? But the fellow who checked his present against that given to his boss will remember the company which "short-changed" him. If we are going to try to influence someone, let's do it without bringing Christmas into the act.

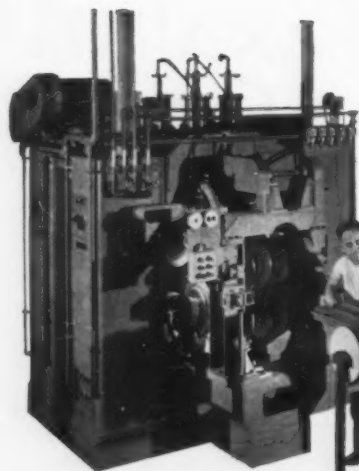
Maybe our commercial gift complex could be directed more to those closest to us in our own company. It's a new twist anyway.

Tom Campbell

Editor-in-Chief

Accent on Excellence

Youngstown cold-rolled sheets



At American Steel Band's Pittsburgh Works, Youngstown Cold-Rolled Sheets—after roll forming—are being welded into cellular electrical flooring sections.

Cellular steel electrical flooring produced by American Steel Band Company provides high strength with light weight—saves both structural steel and construction time. As the result of its specification for Pittsburgh's new B&O railroad terminal, unlimited electrical access will be available throughout the structure's entire floor area.

Basic material for fabricating these rugged scientifically designed flooring sections is Youngstown Cold-Rolled Sheets—a steel that's quality-controlled through every step in its production from ore mine to finish rolling.

Wherever steel becomes a part of things you make, the high standards of Youngstown quality, the personal touch in Youngstown service will help you create products with an "accent on excellence".



THE
YOUNGSTOWN
SHEET AND TUBE COMPANY
Youngstown, Ohio

Manufacturers of Carbon, Alloy and Yaloy Steel

Lithium for Scale-Free Heat

Test specimens of steel, after heat treating in the presence of lithium, were found to be covered with a very thin, shining protective layer. Protection against scale-formation was effective even during the cooling-off period in air. Lithium compounds were introduced into the furnace through the gas pipe, using a piston. Red flames, indicating the presence of lithium, ease the job of controlling the feed.

Advance in Tool Geometry

Look for early announcement of a startling improvement in precision single-point tools. Resulting from research at one of the leading makers of precision jig borers, it's a change in basic tool geometry: points are ground in conical form rather than conventional cylindrical shape. Prototype users report greater precision, longer tool life and other advantages.

Vacuum Braze Honeycomb

A prototype design of vacuum brazing equipment has shown production cycles of under 3 hours from cold start to cold finish. The high vacuum atmosphere eliminates the need for costly inert gas. Production-scale equipment is being made ready to meet the expansion in honeycomb brazing expected in Air Force requirements for honeycomb structures.

Trouble with Research Aid

Congressional efforts to raise the calibre of government research have been largely thwarted. Extra-high salaries, authorized to attract top people to government from industry, have gone astray. In many cases, the extra money was used instead to raise the pay of old-line government workers. Congress complains this is a flat circumvention of the purpose of the grant.

Join Polisher, Microscope

With electrolytic polishing being applied as a method of preparing metal specimens for microscopy, a new instrument combines an electrolytic

polisher with a direct-illumination microscope. The surface of the specimen can be observed and even photographed during the course of electrolytic treatment. Treatment of the specimen can be interrupted the moment the requisite finish is observed.

More Columbium Additions

More mills are looking to columbium as a means of adding strength to mild carbon steels. One producer has come out with a commercial line of columbium strengthened steels. Eleven more are experimenting with them. Two of the eleven are making full heats; others are working with ingot additions.

Lifetime Fabric Bearings

Non-lubricated fabric bearings will be used in the suspension and steering system of at least one 1960 automobile. Useful life of the bearings is claimed to be 10 times that of metal-to-metal bearings. While eliminating the need for lubrication, they will provide smoother riding and easier handling as a result of their self-lubricating qualities.

To Lighten Plate Girders

Recent tests indicate less expensive steel structures. They show that present specifications call for more stiffeners than are needed. Further, tests show that stiffeners work differently than had been supposed—they need not touch flanges at top and bottom as current specs require.

Thermograph for Inspection

Temperature patterns may open up an easy, accurate way to detect flaws hidden beneath the skin of honeycomb panels. In the new method, the top surface of the specimen is coated with an oil film and infrared heat is applied underneath. Heat traveling upward along the most conductive path displaces the surface film in a pattern that reflects the arrangement of the conductive material. The method provides visual or photographic interpretation.



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with a new type of tooth construction. This new file now cuts filing costs wherever many companies file metal.

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LETTERS FROM READERS

Brainwashing

Sir—I would like to congratulate you on your editorial in the Nov. 20th issue (Who is Brainwashing? We're Doing It Ourselves). It seems to me there is a gradual awakening on the part of many responsible people to just the points you bring out in this editorial. We have been told over and over again that anything new is automatically good. Like yourself, I cannot fully accept this idea.

The results on the November elections may give rise to the question of whether we have reached the point of no return. I was very happy to see Gulf Oil Company join General Electric Co. in a frontal attack on this type of thinking, and I hope they will be joined by many more.

These are the groups which will have to take up the battle and demonstrate to the rest of the country that their approach is sound. As Walter Lippman put it, "A people which does not actively advance its faith, has already begun to abandon it."—R. D. Oldfield, Jr., Ohio Screw Products, Inc., Elyria, Ohio.



"I wish there were some way we could keep this out of the papers."

Special Alloys

Sir—Please send us three copies of your fine article entitled, "How to Get More for Your Special Alloy Dollar", appearing in Oct. 16 IRON AGE.

This is undoubtedly one of your finest pieces of work, written in a language easily understood by a common layman.—D. P. Minyard, Mgr., Industrial Div., Electric Steel Foundry Co., Danville, Ill.

Sir—Please supply me with two copies of your article on special ferrous alloys. I thoroughly enjoyed the article. It was well written and presented a timely discussion of an important topic. I would like to use the reprints for my permanent reference file. — L. Dosh, Laco Methods Section, General Electric Co., Pittsfield, Mass.

Forgeability

Sir — Please send three reprints on "How Alloying Elements Affect Steel Forgeability" which appeared in the Nov. 13 issue. This being a very complex subject, is a very courageous attempt to correlate existing information and add something to it. The authors are to be congratulated. — D. P. Rogers, Chief Metallurgist, Unit Drop Forge, Milwaukee 1, Wis.

Sir—It is an excellent article on the effects of alloys on hot workability and should make a desirable reference for future work along this line in which we are interested.—J. H. Shank, Supt., Quality Control Dept., The Colorado Fuel and Iron Corp., Pueblo, Colo.



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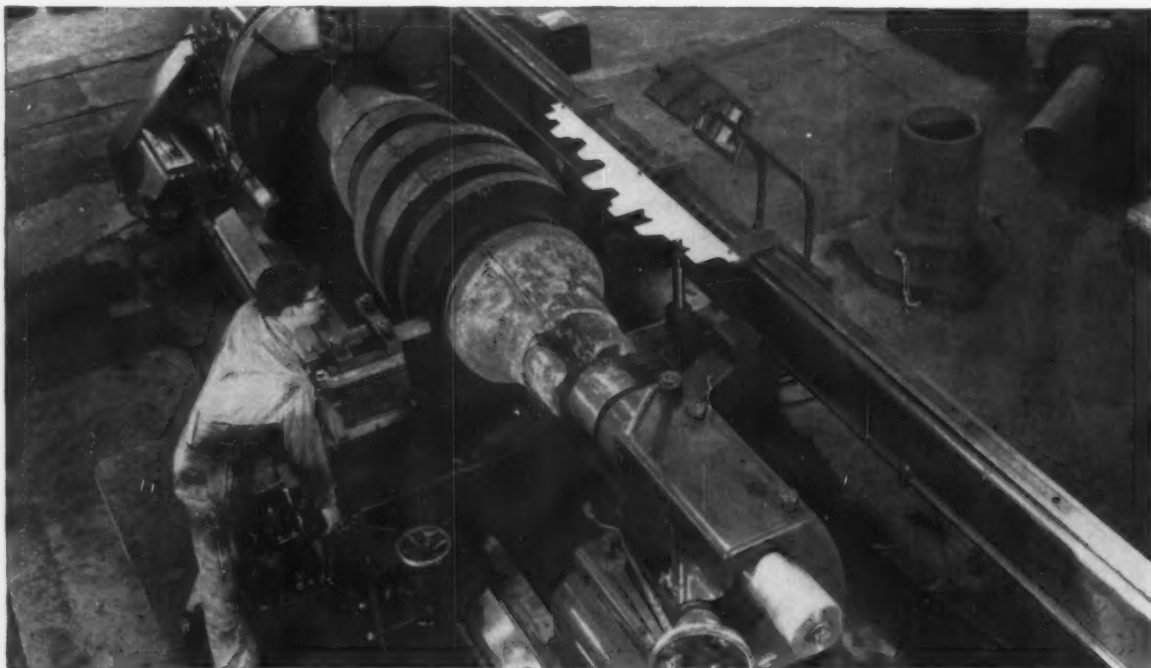


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PROGRESS IN ROLL MAKING

contour turning of iron and steel rolls



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Plants: Granite City, Ill.—Eddystone, Pa.—Avonmore, Pa.

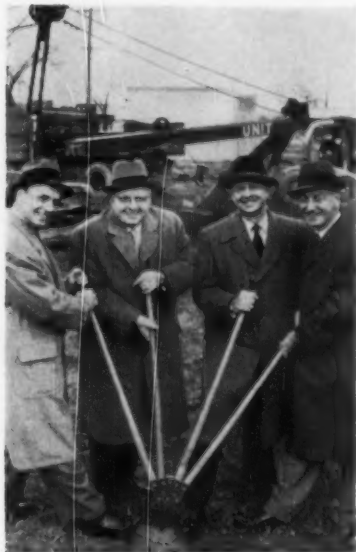


FATIGUE CRACKS

Four Handles, One Spade

Executives at Gray & Kilgore, Inc., large Detroit industrial advertising agency, believe in looking ahead. They proved it recently when they prepared to break ground for their new \$200,000 headquarters.

What can be more frustrating or confusing at a ground breaking, they thought, than only one spade among many energetic diggers. And how do you decide who gets first crack at it.



Gray & Kilgore men had a clever solution for that one. They came up with a specially built four-handed spade with room for everyone. (See photo.)

Doing the honors are (l. to r.): Robert E. Kilgore, Detroit Mayor Louis C. Miriani, Police Commissioner Herbert W. Hart, and Charles M. Gray.

The agency, which has doubled its advertising billings in the past four years, also showed forward thought in planning the building.

The structural design will permit adding a second floor when expansion requires it.

Plant Yardstick

The brief biographical notes on Harold B. Maynard, author of this week's IRON AGE Special Report to Management (p. 63), don't begin to cover all the present and past honors the author has received for his contributions to scientific management. The list is as long as your arm.

And it only hints at the voluminous amount of work done and the statistics compiled in developing a scientific approach to such unscientific (usually) areas of work as janitors, carpenters, etc.

His firm, for example, has developed nearly 500 time formulas covering practically every kind of maintenance work done in industry, government installations, housing developments, and others.

The actual application of time standards, work groupings, and master training concepts is much too complex to be described in detail in less than a series of lectures. But while Mr. Maynard is principally concerned with scientific methods, he doesn't neglect the practical aspects in indirect labor training, assignment of work, and preventive maintenance.

When you read Mr. Maynard's story on how to control indirect labor costs, it's sure to give you some immediate ideas on improvement in your plant, as well as outlining possibility of a full scientific approach.

**FLEXIBLE
TUBING**
FOR EVERY APPLICATION
...PRODUCT...PURPOSE

PENFLEX

Interlocked, corrugated . . .
braided, plain or rubber covered
... copper, steel, brass or stain-
less steel . . . from 1/8" to 24"
I.D. Penflex makes all types and
sizes for all applications and op-
erating conditions.

Penflex Flexible Metallic Tubing is
made for rugged, long lasting
service. It defies heat, abrasion,
crushing . . . will convey every-
thing from semi-solids to the light-
est volatile. Get full information.
Write . . . Pennsylvania Flexible
Metallic Tubing Co., Inc., 7210
Powers Lane, Philadelphia 42, Pa.



**NEW
DATA BOOK**

Get your
free copy.



PENFLEX

TIGHT AS A PIPE BUT...

FLEXIBLE



Minimum hot taphole life 20 heats with Permanente 165 Ramming Mix!

20-25 heats: "Installed Permanente 165, and now taphole life has gone up from 3-5 heats (competitive mix) to 20-25 heats."

23½ heats: "Taphole life in the big shop is up to 23½ heats with Permanente 165. Everyone is well satisfied."

25-40 heats: "Running between 25 and 40 heats taphole life in the old shop, depending on size of furnace. New shop getting 20-25 heats on the 300 ton furnaces."

Operators who have switched to Permanente 165 Ramming Mix consistently report hot taphole performance like this—*more proof* of the time-saving and money-saving advantages you gain with Kaiser Basic Ramming Mixes!

Permanente 165 is made from high purity Kaiser Periclase refractory grains (94-96% MgO) and ceramically bonds itself into a crystalline mass at relatively low temperature, providing fast furnace availability. When "cured," this mass becomes a monolithic structure with exceptional volume stability, maximum resistance to hydration and to attack by iron oxide and slag. For furnace bottoms, its installed high density (averaging 175 pounds per cubic foot) assures longer life.

Make your own comparison test and see how much more life you get with Permanente 165 Ramming Mix. Your Kaiser Chemicals Sales Engineer will be glad to help.*

*Ask for details on the new K/R Gunning System.

Call or write Kaiser Chemicals Division, Dept. S8152, Kaiser Aluminum & Chemical Sales, Inc., at any of the regional offices listed below:

PITTSBURGH 22, PA. 3 Gateway Center
HAMMOND, IND. 518 Calumet Building
OAKLAND 12, CALIF. 1924 Broadway



Refractory Brick & Ramming Materials • K/R Gunning Systems
Castables & Mortars • Magnesite • Periclase • Deadburned Dolomite • Aluminas

COMING EXHIBITS

Ornamental Iron Trade Show—Jan. 8-10, Atlanta Biltmore Hotel, Atlanta, Ga. (National Ornamental Iron Mfrs. Assn., 1977 College Ave., N. E., Atlanta, Ga.)

Plant Maintenance & Engineering Show—Jan. 26-29, Public Auditorium, Cleveland. (Clapp & Poliak, Inc., 341 Madison Ave., New York 17.)

International Heating and Air Conditioning Show—Jan. 26-29, Convention Hall, Philadelphia. (International Exposition Co., 480 Lexington Ave., New York 17.)

Western Metal Show—March 16-20, Pan-Pacific Auditorium and Ambassador Hotel, Los Angeles. (American Society for Metals, 7301 Euclid Ave., Cleveland 3.)

Corrosion Show—March 16-20, Chicago. (National Assn. of Corrosion Engineers, 1061 M & M Bldg., Houston 2, Texas.)

Industrial Finishing Show—June 15-19, Detroit Artillery Armory, Detroit. (Information: H. J. McAleer, 3171 Bellevue, Detroit 7, Mich.)

MEETINGS

JANUARY

Aluminum Window Mfrs. Assn.—Winter meeting, Jan. 7-8, Key Biscayne Hotel, Miami, Fla. Society headquarters, 75 West St., New York 6.

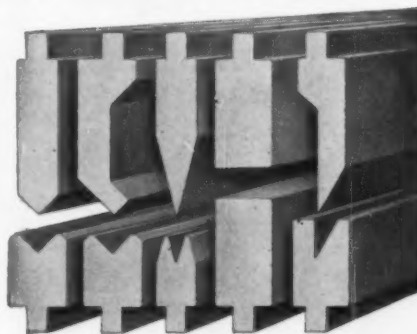
Institute of Scrap Iron & Steel, Inc.—Annual convention, Jan. 11-14, The Waldorf Astoria, New York. Institute headquarters, 1729 "H" St., N. W., Washington, D. C.

Society of Automotive Engineers—Annual meeting and engineering display, Jan. 12-16, Sheraton-Cadillac and Hotel Statler, Detroit. So-

(Continued on P. 16)

-
- ALABAMA**
- Birmingham
- Hinkle Supply Co., Inc.—FAirfax 2-4541
- CALIFORNIA**
- Los Angeles
- Meyer Sheet Metal Mchry. Co.—VAn Dyke 1477
- San Francisco
- Harron, Rickard & McCone Co.—ATwater 2-2202
- GEORGIA**
- Atlanta
- Allison Mchry. Co.—JACKSON 4-1741
- INDIANA**
- Indianapolis
- E. L. Humston Co., Inc.—WAlnut 5-9691
- IOWA**
- Bonaparte
- Corry's Machine & Tool Co.—Phone: 112
- KANSAS**
- Wichita
- Ellfeldt Mchry. & Supply Co.—AMherst 7-9773
- MASSACHUSETTS**
- Cambridge
- Austin-Hastings Co., Inc.—KIrkland 7-4480
- MICHIGAN**
- Detroit
- J. Lee Hackett Co.—TRinity 2-6442
- MINNESOTA**
- Minneapolis
- Minnesota Steel Supply Co.—FEderal 3-6273
- MISSOURI**
- Kansas City
- Ellfeldt Mchry. & Supply Co.—VICTOR 2-5494
- NEW YORK**
- New York
- Federal Machinery Corp.—CAnal 6-3022
- Triplex Machine Tool Corp.—HAnover 2-4520
- H. Weiss & Co.—CAnal 6-4256
- NORTH CAROLINA**
- Greensboro
- Armentrout Mchry. Co.—Phone: 4-8218
- OHIO**
- Cincinnati
- Cincinnati Mchry. Co., Inc.—TRinity 1-0853
- Cleveland
- George D. Miller Co.—MAin 1-1667
- Columbus
- Vorys Brothers, Inc.—AXminster 4-4701
- OKLAHOMA**
- Oklahoma City
- Hart Industrial Supply Co.—REgent 9-2541
- Tulsa
- Hart Industrial Supply Co.—LUther 3-2175
- OREGON**
- Portland
- Pacific Metal Co.—CApital 7-0693
- PENNSYLVANIA**
- Philadelphia
- Delaware Valley Mchry., Inc.—WIlLOW GROVE 4600
- Milton Equipment Co.—WAlnut 2-1734
- Pittsburgh
- Wm. K. Stamets Co.—ATlantic 1-8091
- TENNESSEE**
- Nashville
- Pearl Equipment Co.—CHapel 2-5476
- TEXAS**
- Dallas
- Briggs-Weaver Mchry. Co.—LAKESIDE 8-0311
- Fort Worth
- Briggs-Weaver Mchry. Co.—EDison 6-5621
- Houston
- Mehl Machinery, Inc.—FAirfax 3-1313
- WASHINGTON**
- Seattle
- Pacific Metal Co.—MAin 6925
- WISCONSIN**
- Eau Claire
- Production Equip. Inc.—TEmple 2-3483
- Milwaukee
- Production Equip. Inc.—GREENfield 6-6075
-
- CANADA**
- A. R. Williams Machinery Co., Ltd.
- ALBERTA**
- Calgary—Phone: 5-4425
- Edmonton—Phone: 24341
- BRITISH COLUMBIA**
- Vancouver—ATlow 9411
- Victoria—Phone: 4-7623
- MANITOBA**
- Winnipeg—SPRuce 4-4458
- NOVA SCOTIA**
- Halifax—Phone: 5-4389
- ONTARIO**
- Hamilton—JACKSON 9-5388
- Ottawa—CENTral 6-3661
- Toronto—EMpire 4-2381
- Windsor—CLearwater 4-4762
- QUEBEC**
- Montreal—RIVERSIDE 8-9381
-

Off-the-shelf DELIVERY



CHICAGO® Induction Hardened* PRESS BRAKE DIES

This organization of local distributors offers immediate delivery on many CHICAGO induction hardened press brake dies. These stock dies are economical, and the quick delivery saves time in tooling. They are available in any length from 4 to 12 feet in increments of 2 feet.

Stock dies are used for a surprisingly large variety of bending operations. And, with CHICAGO induction hardened dies you get bonus performance and increased die life at no extra cost. Remember, these dies can be used in any make or size of standard press brake.

On your needs for press brake dies, call your nearest distributor listed here. With Bulletin D-457 you can order by number. Ask for a copy.

*Induction hardening is a special, high-frequency process used to harden the wear surfaces of CHICAGO dies. Field reports on CHICAGO induction hardened dies show up to ten times longer life than conventional press brake dies.



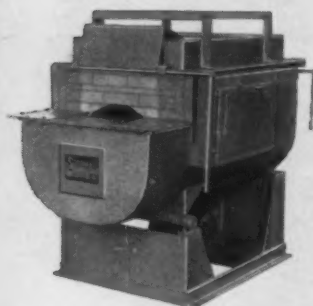
Press Brakes, Press Brake Dies
Straight-Side-Type Presses

Hand and Power Bending Brakes
Special Metal-Forming Machines

DREIS & KRUMP MANUFACTURING CO.

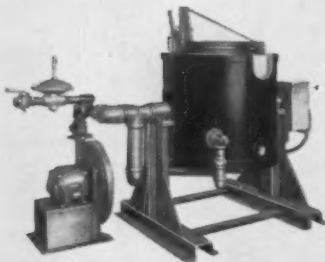
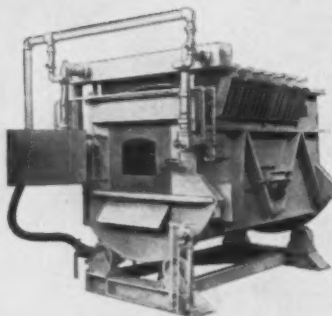
7430 South Loomis Boulevard
Chicago 36, Illinois

HEVI-DUTY adds STROMAN to its Fine Line of Furnaces



Electric Resistance Holding Furnace—Available in several capacities for holding molten aluminum for die casting and permanent mold work.

Reverberatory Furnaces—for breakdown of non-ferrous metals to supply hot metal to holding furnaces. Can be supplied with gas or oil or combination burners. Hydraulic tilting mechanism. Also available are double chamber furnaces for melting and holding in the same furnace.



Crucible Melting Furnaces—for brass, bronze, aluminum and other non-ferrous metals. Stationary or tilting may be tilted manually, hydraulically, mechanically, or by independent hoist. Wide range of sizes.

The Stroman Furnace and Engineering Company, manufacturers of non-ferrous metal melting furnaces and other foundry equipment, has been purchased by Hevi-Duty Electric Company.

The wide range of Stroman-designed foundry equipment will now be produced at Hevi-Duty's new Watertown, Wisconsin, plant. All Stroman equipment now in use will be serviced by Hevi-Duty. For more information, write Hevi-Duty Electric Company, Milwaukee 1, Wisconsin.

- Industrial Furnaces
Electric and Fuel
- Laboratory Furnaces
- Dry Type Transformers
- Constant Current Regulators



EXHIBITS, MEETINGS

(Continued from P. 15)

city headquarters, 485 Lexington Ave., New York 17.

Industrial Heating Equipment Assn., Inc.—Annual winter meeting, Jan. 19-20, Cleveland. Society headquarters, 1145 19th St., N. W., Washington 6, D. C.

Steel Kitchen Cabinet Mfrs. Assn.—Winter meeting, Jan. 20, Blackstone Hotel, Chicago. Association headquarters, 1008 Engineers Bldg., Cleveland.

Steel Shipping Container Institute, Inc.—Winter meeting, Jan. 20-21, St. Regis Hotel, New York. Society headquarters, 600 Fifth Ave., New York 20.

The American Boiler Mfrs. Assn.—Mid-winter meeting, Jan. 22, Statler Hotel, Cleveland. Society headquarters, 4062 Mayfield Rd., Cleveland 21.

Hoist Manufacturers Assn.—Annual meeting, Jan. 22, Palm Beach Biltmore, Palm Beach, Fla. Association headquarters, One Thomas Circle, Washington 5, D. C.

Institute of Surplus Dealers—9th annual trade show, Jan 25-28, New York Trade Show Bldg., New York. Institute headquarters, 700 Eighth Ave., New York.

Truck Trailer Manufacturers Assn.—Annual convention, Jan. 26-28, Hollywood Beach Hotel, Hollywood, Fla. Association headquarters, 710 Albee Bldg., Washington 5, D. C.

Society of Plastic Engineers, Inc.—Annual technical conference, Jan. 27-30. Hotel Commodore, New York. Society headquarters, 65 Prospect St., Stamford, Conn.

Association of Roller & Silent Chain Manufacturers—Annual meeting, Jan. 28-29, Drake Hotel, Chicago. Association headquarters, 3343 Central Ave., Indianapolis.



Up go wire coils out of the way...

Down go handling costs

We're anxious to do far more for our customers than simply take their order and ship the wire. Because we handle so much wire in our own plants, we have learned a lot of money-saving methods. And we're glad to pass them along to you.

For example, coils of wire unloaded in customers' plants are often simply piled on the floor, wasting floor space, cluttering aisles, creating inventory control problems and production headaches.

Bethlehem engineers helped one customer solve his wire storage problem as shown above. Built largely of steel pipe, these racks more than triple

the storage capacity of the floor area. Coils are stored out of the way by lift truck—and quickly removed when ready for use.

We'll gladly help you with such things as pay-off reels and other equipment that will help you cut your wire-handling costs. We can be of special help in wire storage problems because we furnish steel racks of various types.

And remember, too, we make just about every kind of steel wire—both ordinary and special-purpose types. Just get in touch with the Bethlehem sales office nearest you, or write us direct.



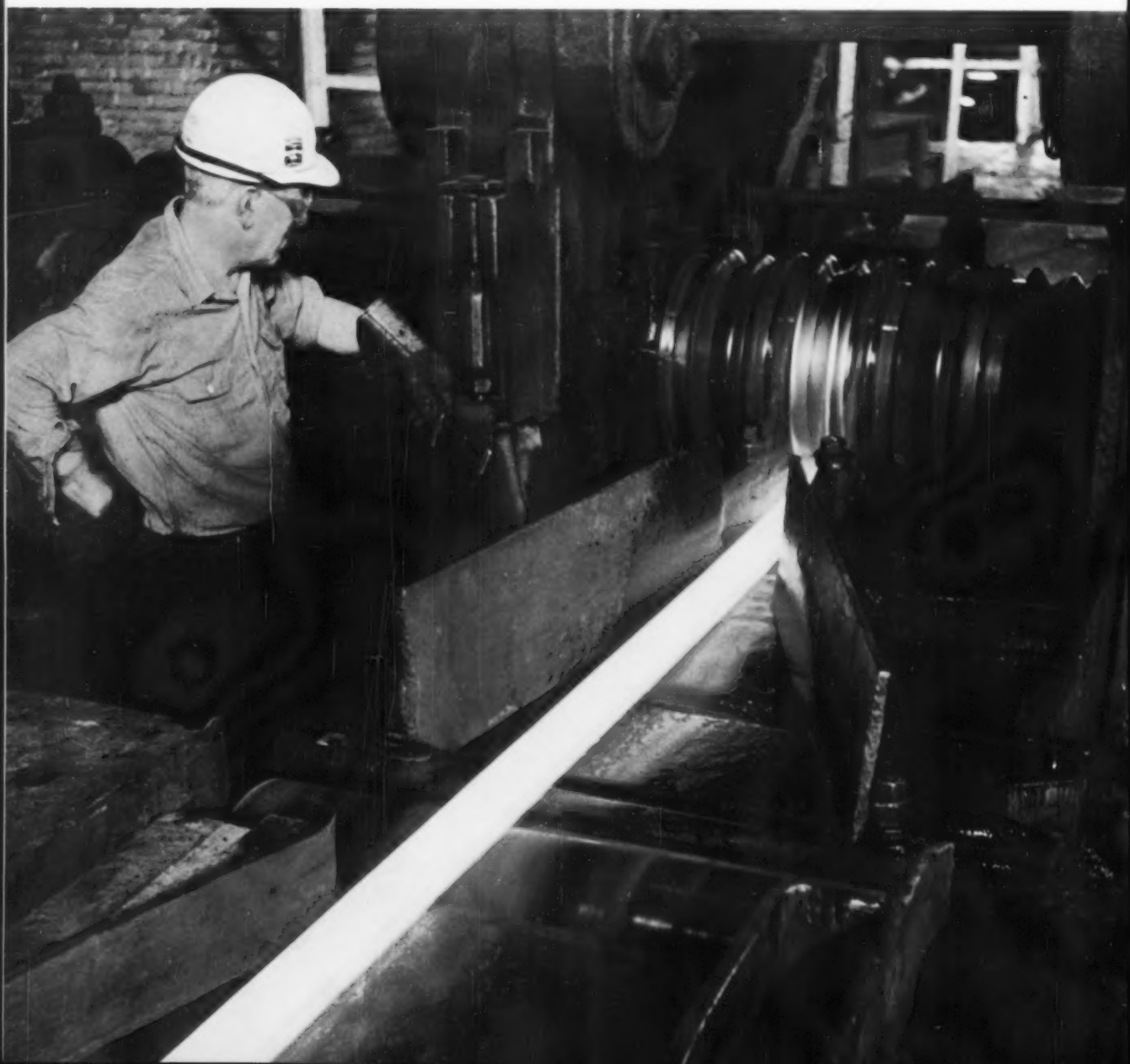
*Bethlehem engineers will help you
with your steel-working problems*



We hot-roll bars to your

We regularly supply a variety of manufacturers with "tailor-made" special steel sections, hot-rolled to precise dimensions. Rolling to size and shape puts strength where it's most needed. And it cuts machining and fabricating operations, reduces scrap loss, often permits better product design.

There's no end to the versatility of Bethlehem special sections. They're used in typewriters, pianos, lawn mowers; in railroad cars, electric motors, and automobile hinges. How about *your* products? Perhaps Bethlehem could help you make them better, faster, cheaper — with hot-rolled special sections. Phone our nearest sales office, or write us at Bethlehem, Pa.



special section

RAILROAD BRAKE BEAM SECTION

Compressing the "T" forces "round" outward to form strong, one-piece solid truss.

PRE-FORMED BLANKS FOR AUTO TRUNK LATCHES

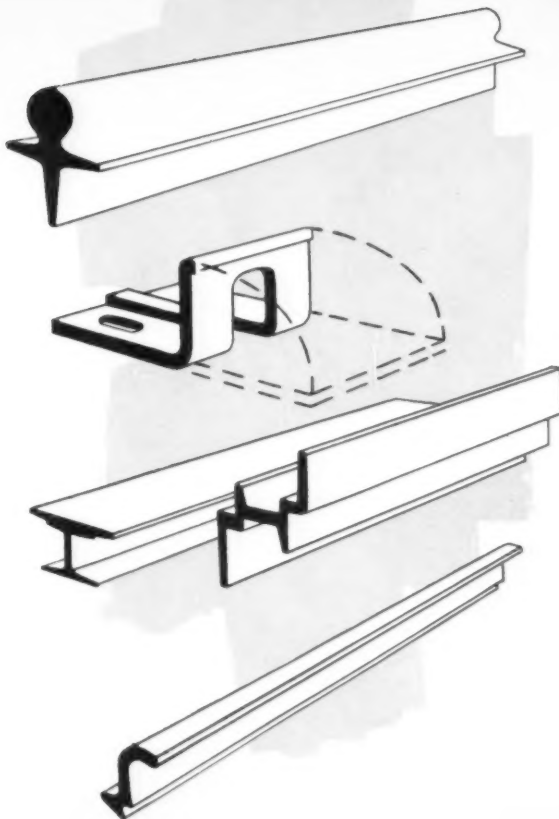
Cold-formed by customer in a closed die.

COMPLEX DESIGNS FOR WINDOW-SASH SECTIONS

Hot-rolled to customers' specifications.

TRUCK TIRE SIDE RING MADE FROM SPECIAL SECTION BAR STOCK

Extra metal rolled into critical points.



In handling this 26-ft, 73-ton shaft, it was necessary to choose the slings with exceptional care. Strength, of course, was all-important. Two types of Bethlehem slings were used—8-part braided slings, and grommet slings with equalizing thimbles. As the photograph shows, the braided slings—with their wide, load-gripping surfaces—were passed around the shaft, then looped over crane hooks suspended from the grommets.

Your own lifts aren't likely to be of such large size. But whether you're handling many tons or just a few hundred pounds, you can lift with confidence when you use Bethlehem wire rope slings.

We make all types. Single-part, double-part, bridles, grommets, etc. Our engineers will design any type of sling for specialized needs, and furnish them quickly. Write for Catalog 368-A, *Bethlehem Slings and Fittings*.



Safe and easy...

with Bethlehem wire rope slings

Forming 100,000 red-hot brackets...

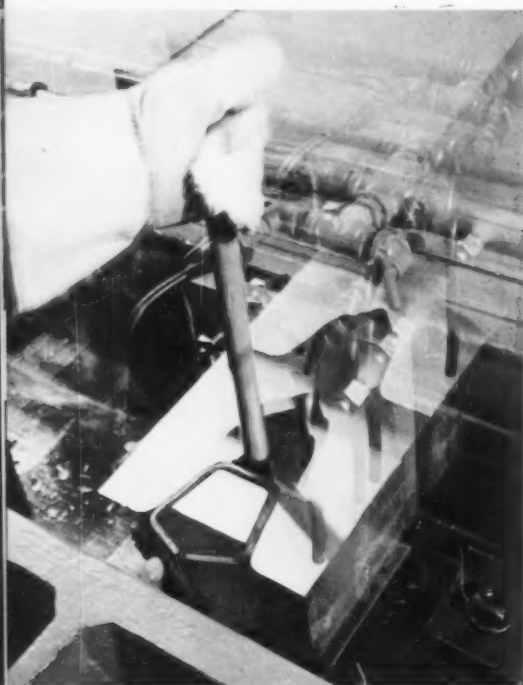
a tough test for tool steel!

Here's a tough test for this hot-work grade of tool steel—forming 100,000 red-hot guard rail brackets, before die redressing is required.

The tool steel used in the bulldozer is Bethlehem's Cromo-W hot-work tool steel. This 5 pct chromium grade, with additions of tungsten and molybdenum, is one of our most popular tool steels for hot-work applications.

Each bracket is made from a piece of 4 in. x 1/4 in. Bethlehem flat carbon steel, cold-punched and sheared to size. Heated red-hot, it is bent into a "U" shape. Then the bar is pressed into semi-final shape, and finally, the third set of Bethlehem Cromo-W dies "sets" the bracket by wrapping it around a mandrel, giving the finished bracket a backbone.

In addition to Cromo-W, Bethlehem manufactures a complete range of other hot-work tool steels for die-casting and extrusion work. In fact, Bethlehem makes top-grade tool steels for every job in the shop. See your nearest Bethlehem tool steel distributor for full details . . . and fast delivery of the right grade for your job. Remember, too, that Bethlehem engineers are always at your service.



The camera catches the action as the die slams to form a red-hot bracket.

Bethlehem Steels and Specialties

Here is a partial list of steels and specialty products in the Bethlehem line:

BARS AND BILLETS:

Carbon and alloy AISI grades
Leaded carbon and alloy steels
Special rolled sections

TOOL STEELS FOR EVERY JOB (28 grades)

FORGINGS: Drop, press, hammer, and upsetter
Rolled-and-forged special sections

SHEETS: Hot- and cold-rolled
Continuously galvanized

TIN MILL PRODUCTS: Electrolytic and hot-dip tin plate; black plate

PLATES: Universal and sheared

ROD AND WIRE: General and special-purpose types
Fine and shaped wire

WIRE ROPE AND SLINGS

FASTENERS: Standard bolts, cap screws, rivets
Special fasteners

PIPE AND TUBES:
Continuous butt-weld
Electric resistance-weld

STRUCTURAL SHAPES

COLD-FORMED SHAPES

PALLET RACKS

WELDMENTS: Frames, tanks, etc.

RAILS: Tee, crane, girder

CASTINGS: Carbon, alloy, and stainless steel
Grey iron; brass and bronze

PUBLICATIONS DEPARTMENT
BETHLEHEM STEEL CO., BETHLEHEM, PA.

M3

Gentlemen: I would like additional information on

Name _____

Address _____

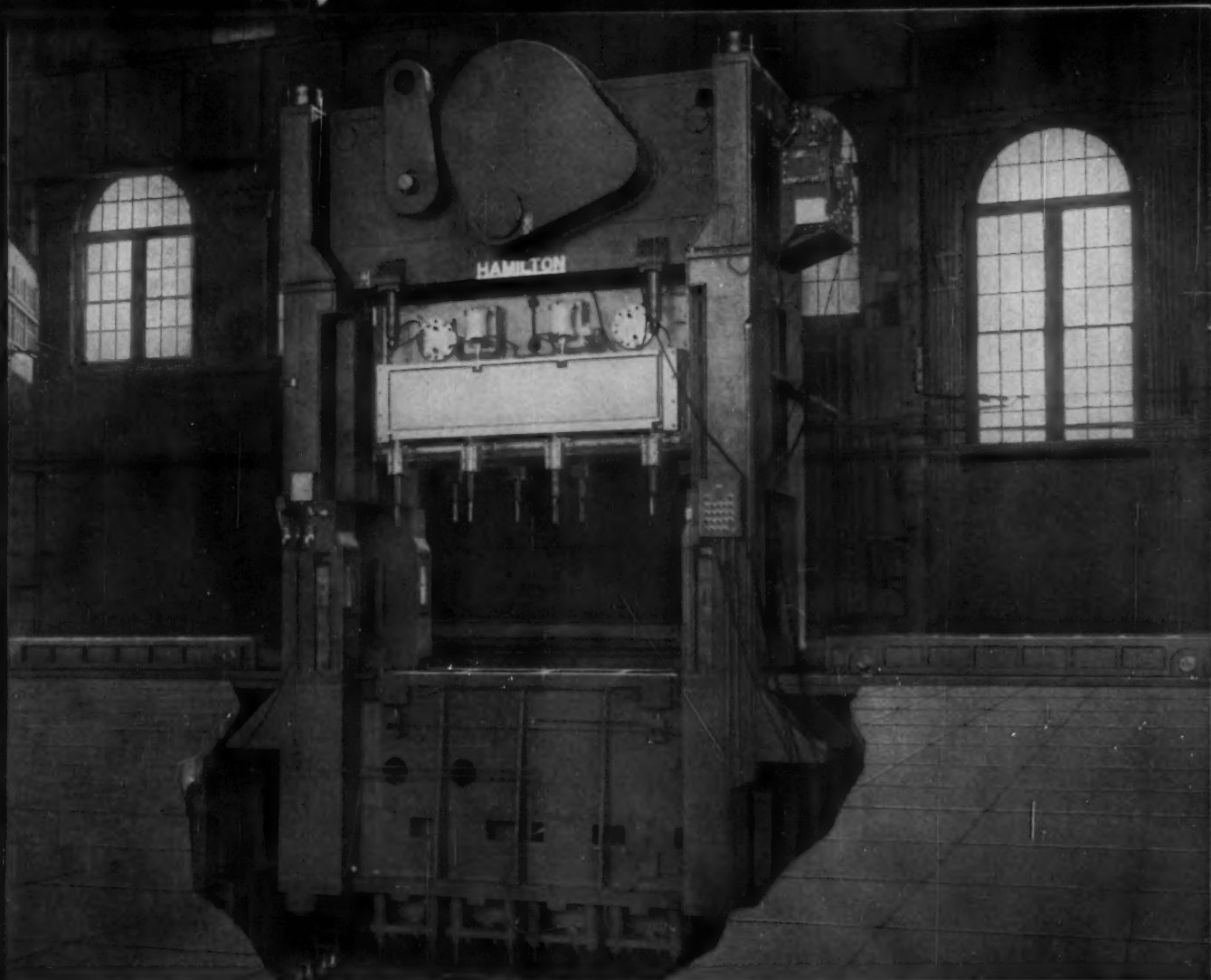
City and State _____

Bethlehem Steel Company, Bethlehem, Pa.

*On the Pacific Coast Bethlehem products are sold by
Bethlehem Pacific Coast Steel Corporation
Export Distributor: Bethlehem Steel Export Corporation*



BETHLEHEM STEEL



Sliding bolsters on this new Hamilton press are shown here in the outermost positions for die loading and/or unloading.

HAMILTON ANNOUNCES A RADICAL NEW PRESS DESIGN

This new Hamilton straight-side press—using sliding bolsters and preset dies—is a radical advance in design for performing such operations as blanking, drawing and forming. Its principal feature is the rapidity with which dies can be changed—and the resulting increase in production. As little as 15 minutes need elapse between the end of one production run and the start of another.

This new Hamilton press is ideal for short runs, assures minimum downtime for changing

dies, means higher production than two conventional presses in many instances. At the same time, it eliminates both the cost of a second press and of additional operators. Also the sliding bolster feature does away with the time-consuming method of jockeying dies with both cranes and fork trucks—an overhead crane can be used exclusively.

Write today to Dept. 2-M for full details on the high production, cost-saving Hamilton press.

Hamilton Division Hamilton, Ohio
BALDWIN · LIMA · HAMILTON

Diesel engines • Mechanical and hydraulic presses • Can making machinery • Machine tools & general machinery



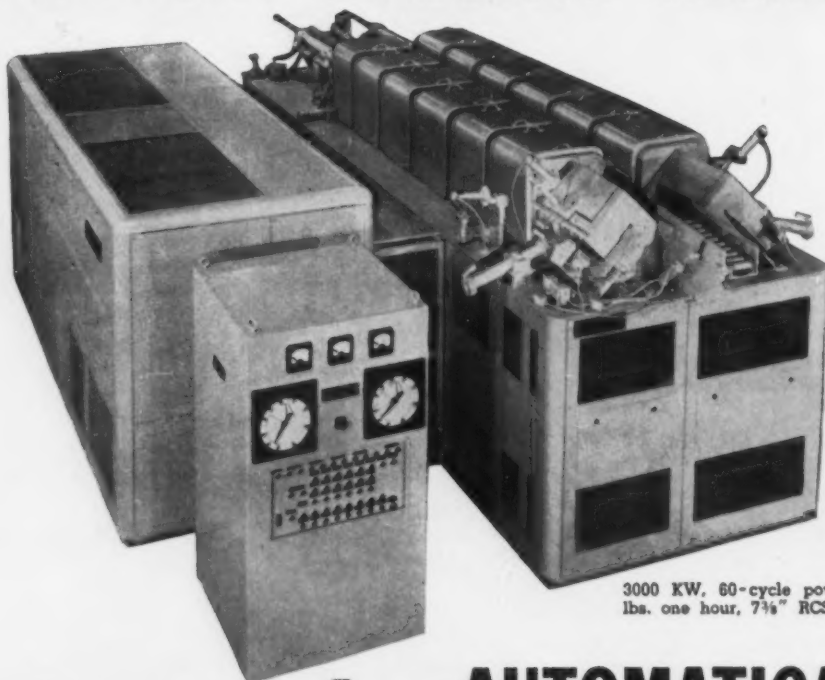
INDUCTION FORGING HEATERS

THAT

START

STOP

AND HOLD



3000 KW, 60-cycle power, 20,000 lbs. one hour, 7½" RCS steel.

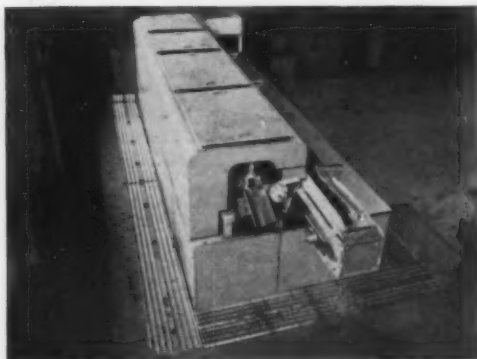
AUTOMATICALLY

These induction heaters for steel forging billets differ from any forge billet heaters ever built.

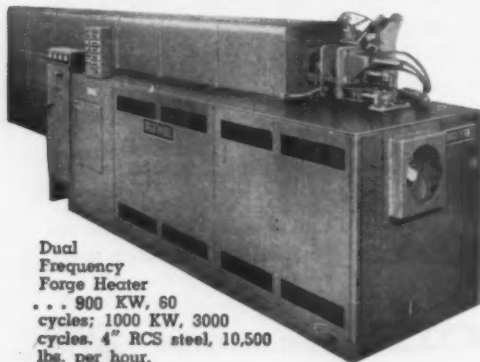
- They are empty at the start—using only two or three dummy billets.
- They have an automatic clean-out—heats are easily segregated.
- They hold at the proper temperature and have automatic voltage regulation.

The heaters keep pace with the press . . . no need of building up a stockpile of heated billets. Completely automatic, the "Magnethermics" eliminate guesswork and deliver a billet at the proper temperature every time.

Magnethermic's engineers have studied forge shop practice for a good many years. If you are considering a modernization program in your forge shop, write Magnethermic for recommendations.



Dual Frequency Forge Heater . . . 500 KW, 960 cycle; 500 KW, 60 cycle. 2"-4" RCS steel, 6000 lbs. per hour.



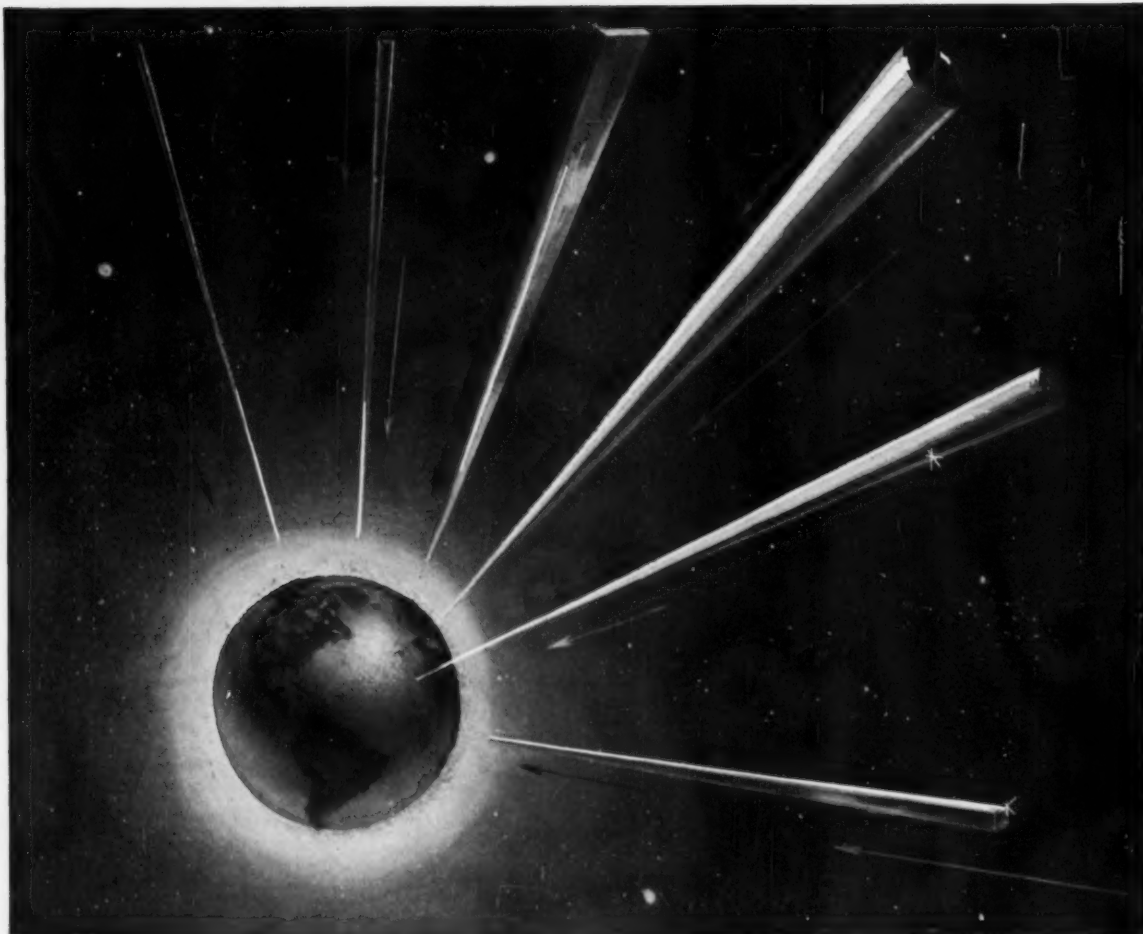
Dual Frequency Forge Heater . . . 900 KW, 60 cycles; 1000 KW, 3000 cycles. 4" RCS steel, 10,500 lbs. per hour.



Movie Available on These Automatic Forging Heaters

16 mm, color; shows the complete cycle of operation. Write to Magnethermic and advise when you would like a showing.

MAGNETHERMIC®
CORPORATION
3990 SIMON RD. • YOUNGSTOWN 7, OHIO



Let's get down to earth about Exotic Metals!

Do you think titanium, zirconium, columbium, tantalum and other exotic metals are "out of this world" for your use?

You may be mistaken. Today the picture is changing. Increased demand and new production techniques are fast bringing their cost and availability *down to earth* for many commercial applications.

In fact, many companies are finding that their use often more than compensates for their extra cost in unparalleled corrosion resistance at high temperatures, better performance and longer service life.

If you have special problems of heat or corrosion resistance... a difficult application that demands unusual mechanical, physical, structural or nuclear properties... these metals deserve careful consideration. And Bridgeport is ready to help you use them.

LOOK INTO THE BRIDGEPORT METALS DEVELOPMENT PLAN

Bridgeport has pioneered in fabricating mill products from exotic metals from the start and has produced many miles of special metals tubes. We have originated many of the processing methods

that are daily transforming these metals from costly rarities to readily available materials in a variety of forms—tube, rod, sheet and extruded shapes. This represents a substantial investment in time, skill and equipment. Because of our confidence in the rapid progress of exotic metals technology, we are prepared to work with you in their application on a cooperative basis. We welcome the opportunity to help solve your most difficult application problems. The coupon will bring prompt action. Send it today.

Dept. 8001, BRIDGEPORT BRASS CO., Bridgeport 2, Conn.

Please send information on the BRIDGEPORT SPECIAL METALS DEVELOPMENT PLAN.

Name _____ Title _____

Company _____

Address _____

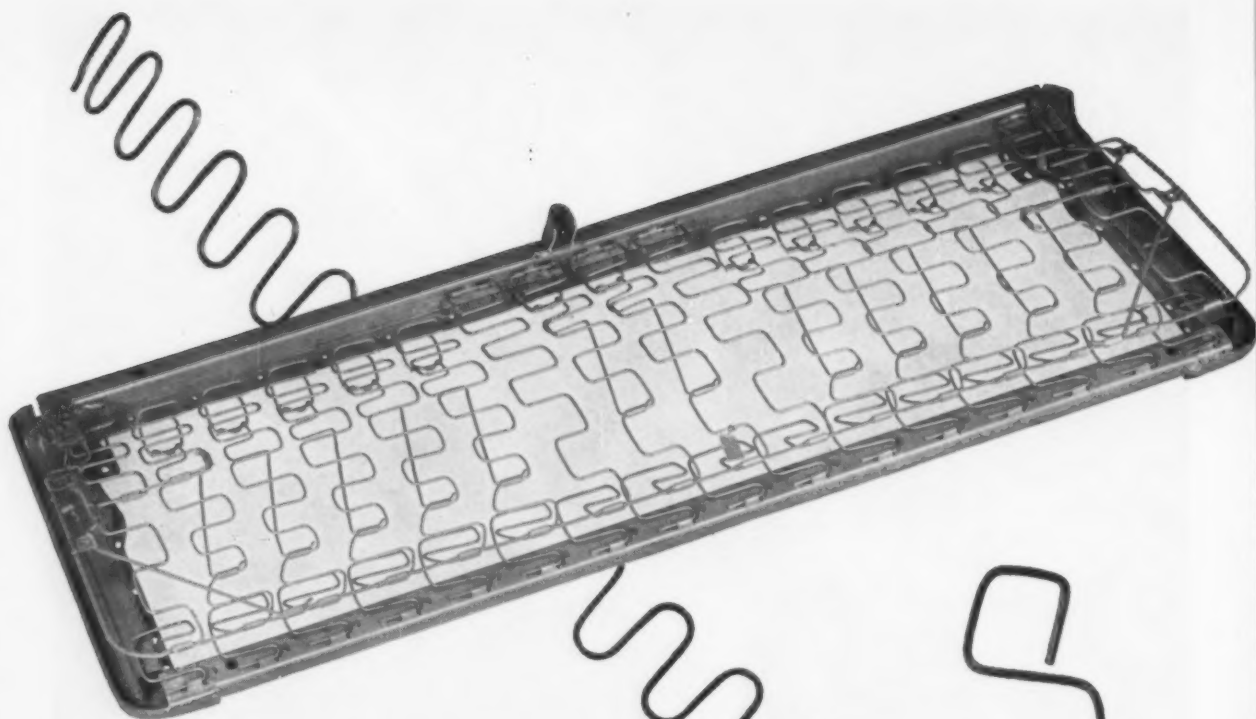
City _____ Zone _____ State _____



BRIDGEPORT BRASS COMPANY

BRIDGEPORT 2, CONNECTICUT

Specialists in Metals from Aluminum to Zirconium



REPUBLIC STEEL **WIRE** HELPS SELL AUTOS

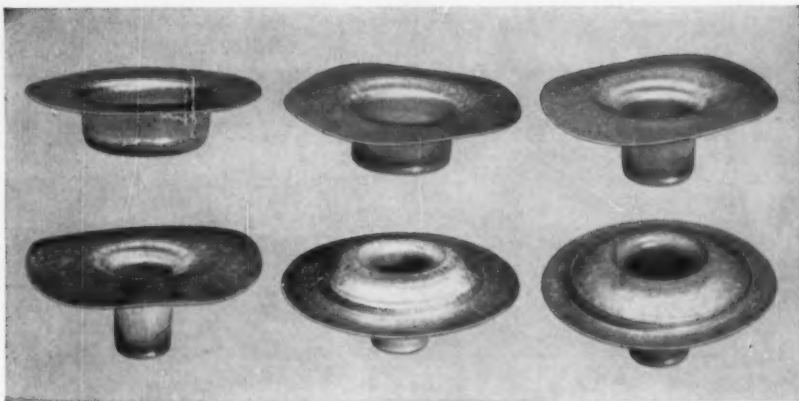
With today's sleek cars being built closer and closer to the ground, the design of functional—yet comfortable—front and rear seats becomes an increasingly complex problem.

The Seating Division of Rockwell-Standard Corporation, a major producer of car seats, has discarded the principle of high-type springing that limits space. Instead it uses Republic round, high carbon MB spring wire to fabricate a relatively flat spring unit called a "square formed" spring. The company also forms the wire into Zig-Zag springs. These two types result in comfortable seats requiring much less height.

Each car model requires a different type of seat construction. Often, Rockwell-Standard has more than a hundred differently designed car seats going through its Seating Division. When a new design problem arises, it calls in Republic specialists on spring wire. These men help determine the proper quality that will take the severe forming and bending required in fabricating the springs.

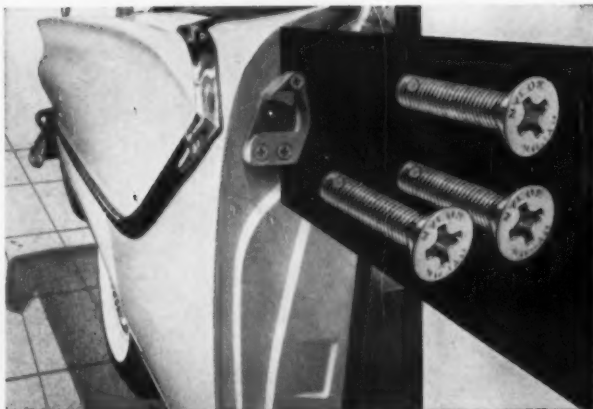
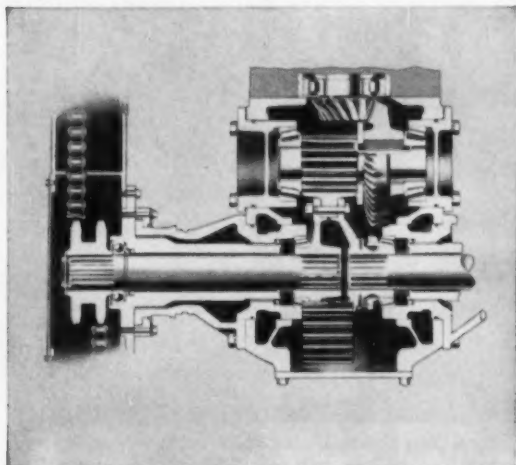
Whether your product calls for high or low carbon wire, Republic Wire Metallurgists are always available to work with you in selection, application, processing, and to make sure you get the best in quality. The coupon will let us know if you would like one to call at your plant.





HERE ARE SIX STEPS of possibly the severest manufacturing torture that a galvanized steel sheet can take. In its final form, it becomes the end piece of a muffler manufactured by the Mackenzie Muffler Company, Inc., Youngstown, Ohio. It is made out of Republic Continuous Galvanized Sheets. Despite the many deep drawing operations, the coating does not crack, flake, or peel. Republic Galvanized Sheets can do a profitable job for you. Clip the coupon and mail it in for more information.

SAFETY COMES FIRST—in the door latching of Ford cars. So Ford engineers have specified Republic Nylok Bolts to anchor the striker plate to the door post. Nylon pellet insert in bolt body forces a tight metal-to-metal lock between mating threads for a positive, vibration-proof clamping action. Republic Nylok Bolts are adjustable and reusable with no loss of holding power. Send coupon for descriptive folder.



EXCEPTIONALLY HIGH STRENGTH-TO-WEIGHT RATIOS plus resistance to fatigue, stress, shock, and impact are values of Republic Alloy Steels that equipment builders have been relying on for years. Engineers and metallurgists of the Adams Division, LeTourneau-Westinghouse Company, for example, spent thousands of hours on research and testing of all types of steels to find one that would reduce ultimate fatigue to an absolute minimum in the drive axle of their "660" Motor Grader. They selected Republic Hot Rolled 4340 Alloy Steel. This fine steel not only resists fatigue, but also is able to take high torque without a permanent set. Specify Republic Alloy Steels where strength and toughness must resist heavy-duty roughness. Our metallurgists will help you.

REPUBLIC STEEL



*World's Widest Range
of Standard Steels and
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REPUBLIC STEEL CORPORATION

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1441 REPUBLIC BUILDING • CLEVELAND 1, OHIO

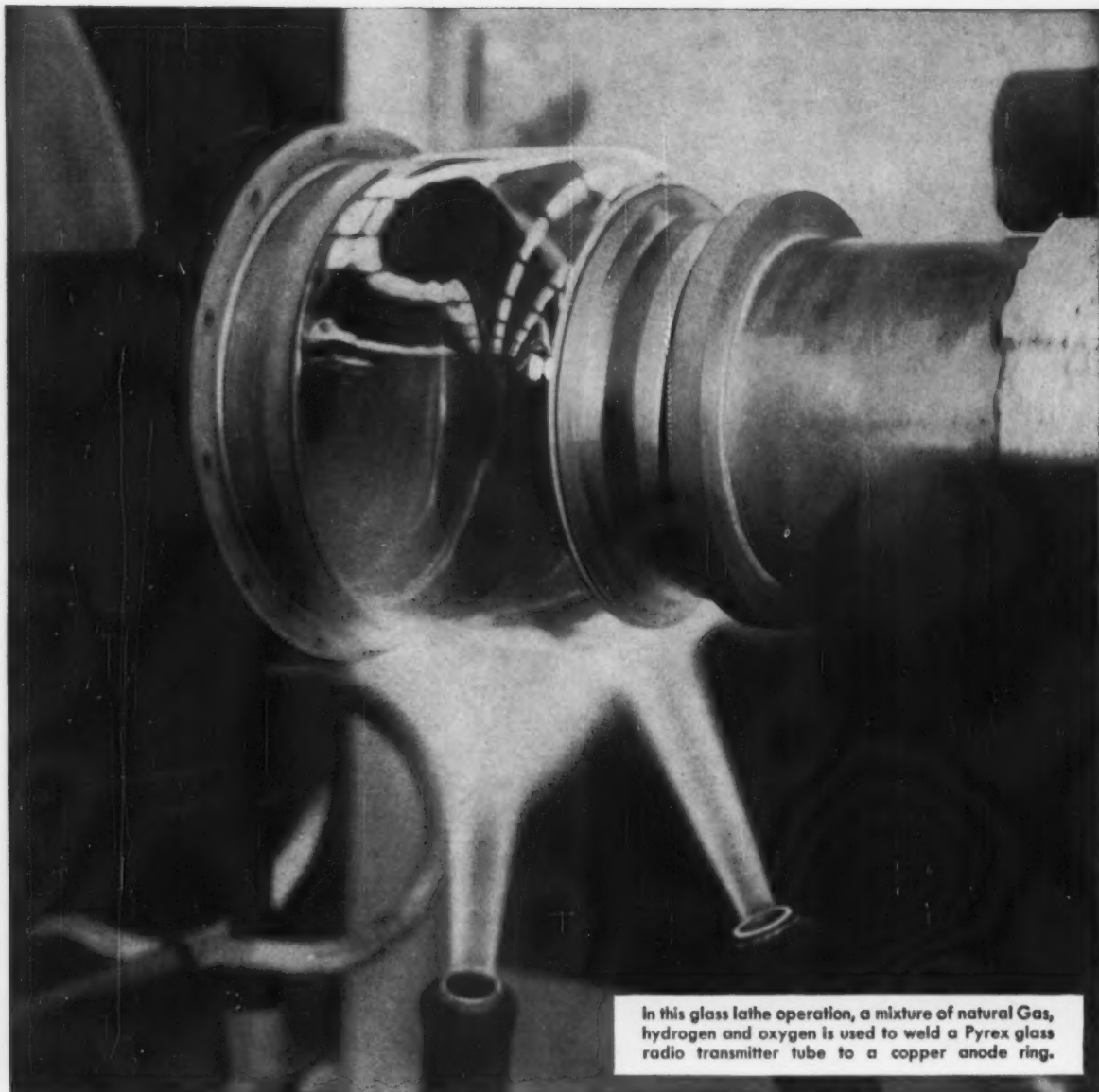
- ☐ Have a Wire Metallurgist call.
Send more information on:
☐ Wire ☐ Continuous Galvanized Sheets
☐ Nylok Bolts and Nuts ☐ Alloy Steels

Name _____ Title _____

Company _____

Address _____

City _____ Zone _____ State _____



In this glass lathe operation, a mixture of natural Gas, hydrogen and oxygen is used to weld a Pyrex glass radio transmitter tube to a copper anode ring.

RCA welds glass to metal at over 2000° F. ...thanks to GAS

Natural Gas is used to weld glass to metal in the production of radio and television tubes of many types at the RCA Tube Division plant in Lancaster, Pennsylvania.

To effect the weld at over 2000° F., a mixture of natural Gas, hydrogen and oxygen maintains the high welding temperature on the Pyrex glass and metal parts as they rotate on a glass lathe. A Gas flame is then used to control and equalize the cooling of the glass down to the 900-600° F. range.

For information on how Gas can help you in your production operations, call your Gas Company's industrial specialist. He'll be glad to discuss the economies and superior results you get with Gas and modern Gas-fired industrial equipment. *American Gas Association.*

See Playhouse 90 with Julia Meade on CBS-TV. Watch local listings for time and station. Sponsored by your Gas Company and the Gas Industry.

Wide variety of Gardner abrasives assures top performance in all surfacing operations



Segmental Wire-Lokt® discs for large horizontal grinders



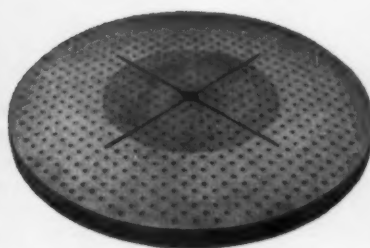
Smooth faced Wire-Lokt discs for general purpose grinding



Narrow face disc with corrugations for cool cutting



Cylinder wheels for use on most popular types of vertical spindle grinders



Combination grade and face with radial lines for even wear and better coolant distribution



Cylinder wheels with square centers for fast stock removal on large areas

range of disc sizes

	diameter	thickness
regular disc	10" to 48"	1" to 3"
segmental disc	53" to 84"	1" to 3"
cylinder wheel	11" to 32"	4" or 5"
square center cylinder wheel	18" & 20"	4" or 5"

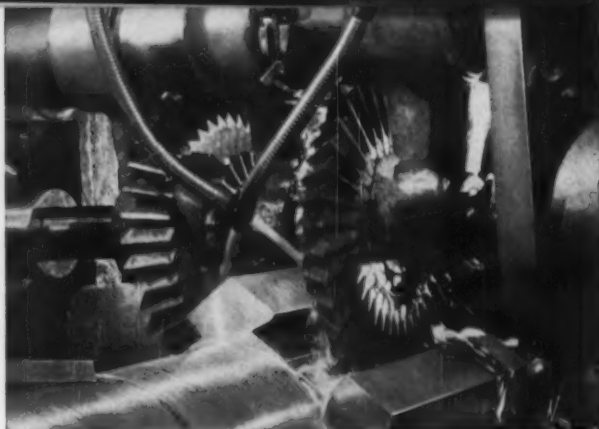
For a review of your flat surface grinding operations, call your Gardner Abrasives Specialist today.

GARDNER

abrasive discs
BELOIT, WISCONSIN



SAVES \$150 PER GEAR—In cutting a double-web design fabricated gear on a gear generator, tool cost formerly averaged \$180 per gear. By switching to ALCO Hi-Qua-Led Steel with its lower friction component, tool wear is reduced, and manufacturer reports savings of approximately \$150 per gear.



MILLING TIME DOWN 71%—Hi-Qua-Led Steel open-die forgings enabled a machine tool builder to reduce time for straddle-mill dovetailing of pentagon shape by 71%. Overall time for piece, including milling, turning and trepanning, is cut 33%, and a significant saving in tools is also noted.



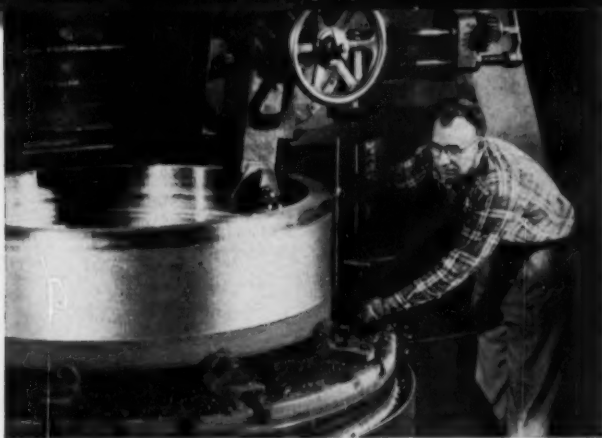
IMPROVED FINISH—A manufacturer reports a much smoother gear finish with ALCO Hi-Qua-Led Steel. There is a complete lack of burrs which formerly required extensive hand filing to remove. In addition, time for this cutting operation on a Fellows gear shaper is reduced 47%, and tool wear is down 20%.



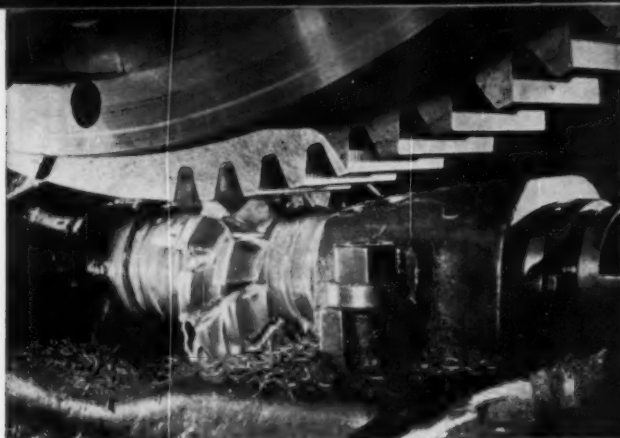
700% INCREASE IN TOOL LIFE—In trepanning a 4 in. diameter hole $42\frac{1}{2}$ in. long with a Warner & Swasey lathe, tool life averaged one piece per tool. With Hi-Qua-Led, 8 pieces are now obtained with the same tool. Manufacturer reports that Hi-Qua-Led Steel also provides much better chip formation.

EASY-MACHINING HI-QUA-LED STEEL* FORGINGS GIVE INDUSTRY NEW OPPORTUNITY FOR PROFIT

* **HI-QUA-LED STEEL**—ALCO's registered trademark for its new process leaded-steel forgings that are making outstanding reductions in tool wear, machining time and production costs.



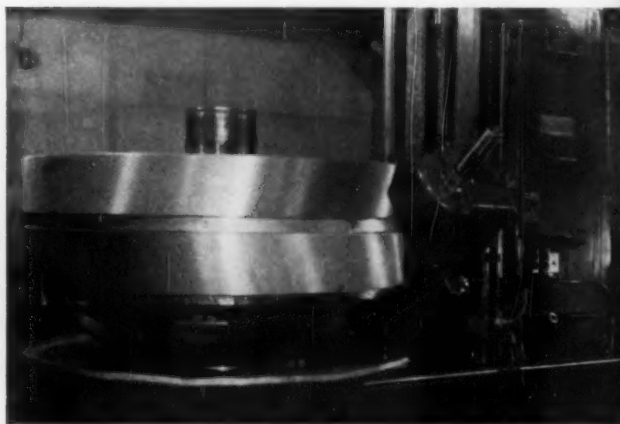
TOOL DOES 3 TIMES THE WORK—With Hi-Qua-Led Steel, a King boring mill operation that once required 3.4 hours is off the machine in 43 minutes. Through the lower frictional properties of Hi-Qua-Led Steel, the manufacturer obtains 10 pieces per tool grind as compared to 3 pieces obtainable with non-lead steel.



8-HOUR JOB DONE IN 3—Another manufacturer reports that roughing and finishing a gear required a total of 8 hours and 8 minutes on his gear cutter. With freer-machining Hi-Qua-Led Steel and the increased speeds and feeds it permits, the job is now completed in just 3 hours and 10 minutes.



FASTER SPEEDS, NORMAL TOOL WEAR—A gear manufacturer using a Fellows gear cutter was able to increase rough-cut speed 37% and finish-cut speed 111% with Hi-Qua-Led Steel. Smoother operation is noted, and the tremendous reduction in machine time is accomplished with only normal wear to cutter.



SAVES FULL WORK WEEK—Using gear blanks of ordinary steel, roughing and finishing on a Gould and Eberhardt machine previously required 65.1 hours. The improved machining qualities of Hi-Qua-Led Steel have speeded up gear production and the job is now completed in 24.9 hours, saving a 40-hour work week.

The easy machinability of ALCO's Hi-Qua-Led Steel® forgings is setting new production records and boosting profit throughout industry. While maintaining all the physical characteristics of regular steel in any AISI grade, forgings of Hi-Qua-Led Steel, ALCO's special process leaded steel, provide the extra benefits of greatly reduced machine time, longer tool life and improved surface finish. In addition, the reduced friction component of Hi-Qua-Led Steel forgings assures much closer tolerances.

By switching to ALCO's Hi-Qua-Led Steel forgings in your operation, you can cut your machining costs drastically. Along with this reduction in costs, Hi-Qua-Led

Steel forgings will provide the same service in your end product as you obtain with regular forgings.

ALCO specialists are available to show you—on your own machines, in your own plant—how Hi-Qua-Led Steel forgings will boost your profit. Forgings are available in seamless rolled circular shapes from 18 to 145 in. OD, in open-die shapes from 1,000 to 30,000 lb and 40 ft long, and in mandrelled seamless circular shapes up to 60 in. wide. Contact the ALCO sales office nearest you for complete details. For a booklet containing technical information on Hi-Qua-Led Steel forgings, write ALCO Products, Inc., Dept. 153, Schenectady 5, New York.

ALCO

ALCO PRODUCTS, INC.

NEW YORK

SALES OFFICES IN PRINCIPAL CITIES

LOCOMOTIVES • DIESEL ENGINES • NUCLEAR REACTORS • SPRINGS • STEEL PIPE • FORGINGS • OIL-FIELD EQUIPMENT

integrated CRUCIBLE steel service



Orders for specialty steels go out fast — usually overnight or even earlier — from *local* Crucible warehouses.

That's because each warehouse has a wide variety of grades and sizes on hand, *at all times*.

gives you local stocks of 16,000 specialty steel items for immediate delivery

Within minutes, the Crucible inside account salesman can tell you if the grades, sizes and quantities you need are available. He'll check his customer's master file for your delivery requirements, billing details, etc. And then he'll quickly arrange for cutting to meet customer's requirements. So deliveries are swift and sure.

This combination of large local stocks and warehouse efficiency means you can fill even the most varied or unusual requisitions for specialty steels with a single phone call.

It's a basic reason why purchasing agents who *depend* on local sources call Crucible *first* — like this one:

"We're basically a tool and die 'job' shop. We never know what steel we'll be using from one day to the next. So whatever we need, we need fast. It has been our experience that it saves time to call the Crucible warehouse first."

Why not simplify and speed up your specialty steel purchases by relying on your local Crucible warehouse? The advantages of Crucible's entire integrated operation, from mining the ore to steelmaking and warehouse delivery, are all available through the nearby source. *Crucible Steel Company of America, Dept. PL06, The Oliver Building, Mellon Square, Pittsburgh 22, Pa.*

STOCK LIST

Keeps you up-to-date on local stocks of specialty steels. Just ask the Crucible salesman to place your name on the regular mailing list.

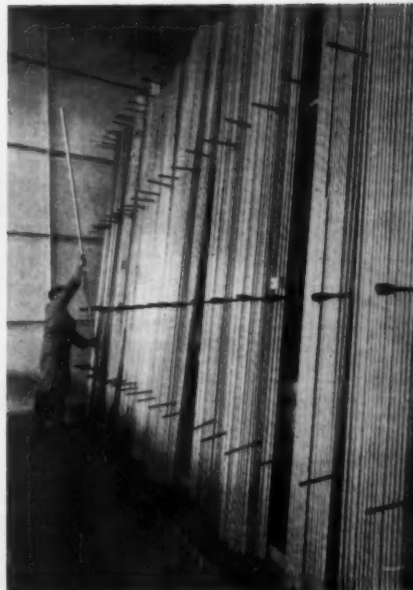
One Source
For All
These Steels



Local warehouse can fill both large and small orders from stocks like these of hollow tool steel sections and solid rounds.



The casting die steels and plastic mold steels stand ready for cutting to order and immediate delivery.



Most Crucible warehouses stock stainless bars — stack them upright in "A" racks to protect the surfaces.

TOOL STEELS—Water, oil, air hardening, shock resisting, hot work, plastic and die casting steels in all forms, including bars, sheets, plates, drill rod, hollow bars, forgings and flat ground stocks

HIGH SPEED STEELS—Crucible's famous "Rex"® steels; Rex Thrift Finish rounds, hot rolled and cold drawn flats and squares, drill rod, forgings, sheets, plates, and tool bits

STAINLESS STEELS — Bars, sheet, strip, wire, cold heading wire, metalizing wire, plates, angles

FREE MACHINING STEELS — Crucible Max-el® rounds, hexagons, plates and brake die steel

ALLOY STEELS — Bars, billets, strip and sheet

COLD ROLLED CARBON SPRING STEELS

DRILL STEELS — Hollow and solid drill steels

ALUMINUM EXTRUSION DIE STEELS

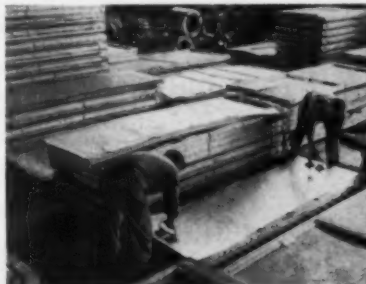
HOLLOW TOOL STEEL

WELDING AND HARD FACING ROD

PLASTIC MOLD STEELS

PERMANENT MAGNETS

— and many others



Need stainless sheet? The local warehouse stocks most types, finishes and sizes for prompt delivery to you.

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PRECISION DROP FORGINGS ARE PRODUCED CONTINUOUSLY AND AUTOMATICALLY

TODAY new principles, not unlike those which have revolutionized other segments of industry, have been applied by Chambersburg engineers to the forging process. The result is an entirely new concept of that process, pointing the way to greater productivity, reductions in unit cost, uniformity of product and assuring safer, cleaner working conditions. ● Automatic forging equipment, designed and built by Chambersburg, is at work today in a number of shops. ● Motion picture studies of these installations are available for individual executive or group showings. ● Let us assist you in your forging plans for tomorrow. A conference may be arranged through the Chambersburg representative in your area, or, if you wish, write or phone us at Chambersburg Engineering Co., Chambersburg, Pa.



Pittsburgh Bicentennial
1758 - 1958 - 59

To Pa Pitt, we are
youngsters, but in
the Steel Industry
we are one of the older
members of the family.
For 56 years, we have been
making Pipe & Tube Mills,
Sheet and Strip Equipment,
Continuous Processing
Lines, Drawbenches, Rolls,
and Other Products for
Steel... as well as the Copper,
Brass, Aluminum, Rubber,
and Chemical Industries.
We salute Pa Pitt's
200th Birthday and
plan to be around
for another salute on
his next Centennial.

the
Aetna-Standard
engineering
company

General Offices:
Pittsburgh, Pa.

Plants:
Ellwood City, Pa.
Warren, Ohio

Research Laboratory:
Akron, Ohio

When you buy from U. S. Steel



STEEL + PLUS IN ACTION: FACILITIES

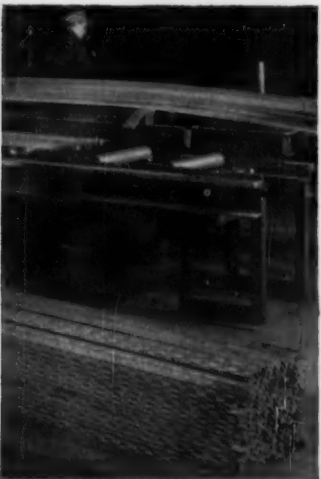
You're looking at the largest lock-coil cable in the world. It was specially designed and built by U.S. Steel's American Steel & Wire Division for the main tramway used in construction of the Glen Canyon Dam in Arizona. Construction crews have nicknamed it "the main gut," because it will carry the concrete and steel that are placed in the dam. The cable is four inches in diameter, has 312 individual steel wires and weighs 38 lbs. per foot. It took complete manufacturing facilities and know-how to produce this unique construction link.

STEEL + PLUS IN ACTION: TECHNICAL ASSISTANCE

When Blaw Knox Company made nose plates for open-grate stair tread, they cut sections from flat plates and bent them into shape—an operation that often cracked the plates and left them for scrap. U.S. Steel offered a special angle section with a raised tread *already rolled* on the top side. This eliminated shearing and forming operations and stopped the scrap waste. The new nose plates are simply cut to length and welded to the grate—at a substantial saving in fabrication and steel costs.



you get **STEEL+PLUS**



STEEL+PLUS IN ACTION: MARKETING ASSISTANCE

Sales of major appliances were never very high during the Christmas selling season—until 1954 when U.S. Steel launched the first annual Snowflake promotion. Since then, Christmas-time appliance sales activity has climbed steadily as a result of this newspaper, magazine, radio, and TV campaign to promote major appliances as Christmas gifts. Hundreds of retailers and manufacturers have used the Snowflake campaign as a master plan. They built their own promotion program around it, using sales kits and aids provided free by U.S. Steel.



STEEL+PLUS IN ACTION: RESEARCH

With an electrical current, this emission spectrograph vaporizes samples of metal. The emitted light spectrum is analyzed to reveal the exact amount of the important elements present in the sample. This type of test on the strip used for tinplate helps U.S. Steel research teams maintain the consistent high quality of tinplate, and guarantees top protection for products packed in steel cans.

USS is a registered trademark

American Bridge • American Steel & Wire and Cyclone Fence • Columbia-Geneva Steel • Consolidated Western Steel
National Tube • Oil Well Supply • Tennessee Coal & Iron • United States Steel Homes • United States Steel Products
United States Steel Supply and Gerrard Steel Strapping • Universal Atlas Cement • United States Steel Export Company

USS United States Steel

spotlighting

A TREMENDOUS TRIFLE

...that dramatically improves the arc stability of your Aircomatic® equipment

Physically, this new contact tube with "floating Chuck" is just a trifle—a simple set of hardfaced "wiping" wires** inserted in the contact tube barrel of your Aircomatic gun. But it gives positive, multiple contact with the welding wire at all times.

It ends interior arcing, prevents burnback, galling, insures good current pickup, increased current capacity and stable arc performance—on Aircomatic welding guns.

The new wiping action contact tube is available in various diameters for the Aircomatic MIGet®, the Aircomatic Pull gun, the Aircomatic push gun (except heavy-duty), and the AMHB Aircomatic head. Optional equipment on all new guns. For complete information, contact your Airco office.

*Trademark

**Patent Applied For



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AT THE FRONTIERS OF PROGRESS YOU'LL FIND AN AIR REDUCTION PRODUCT • Products of the divisions of Air Reduction Company, Incorporated, include: AIRCO—Industrial gases, welding and cutting equipment • AIRCO CHEMICAL—vinyl acetate monomer, vinyl stearate, methyl butynol, methyl pentynol, and other acetylenic chemicals • PURECO—carbon dioxide—gaseous, welding grade CO₂, liquid, solid ("DRY-ICE") • OHIO—medical gases and hospital equipment • NATIONAL CARBIDE—pipeline acetylene and calcium carbide • COLTON—polyvinyl acetate, alcohols, and other synthetic resins.

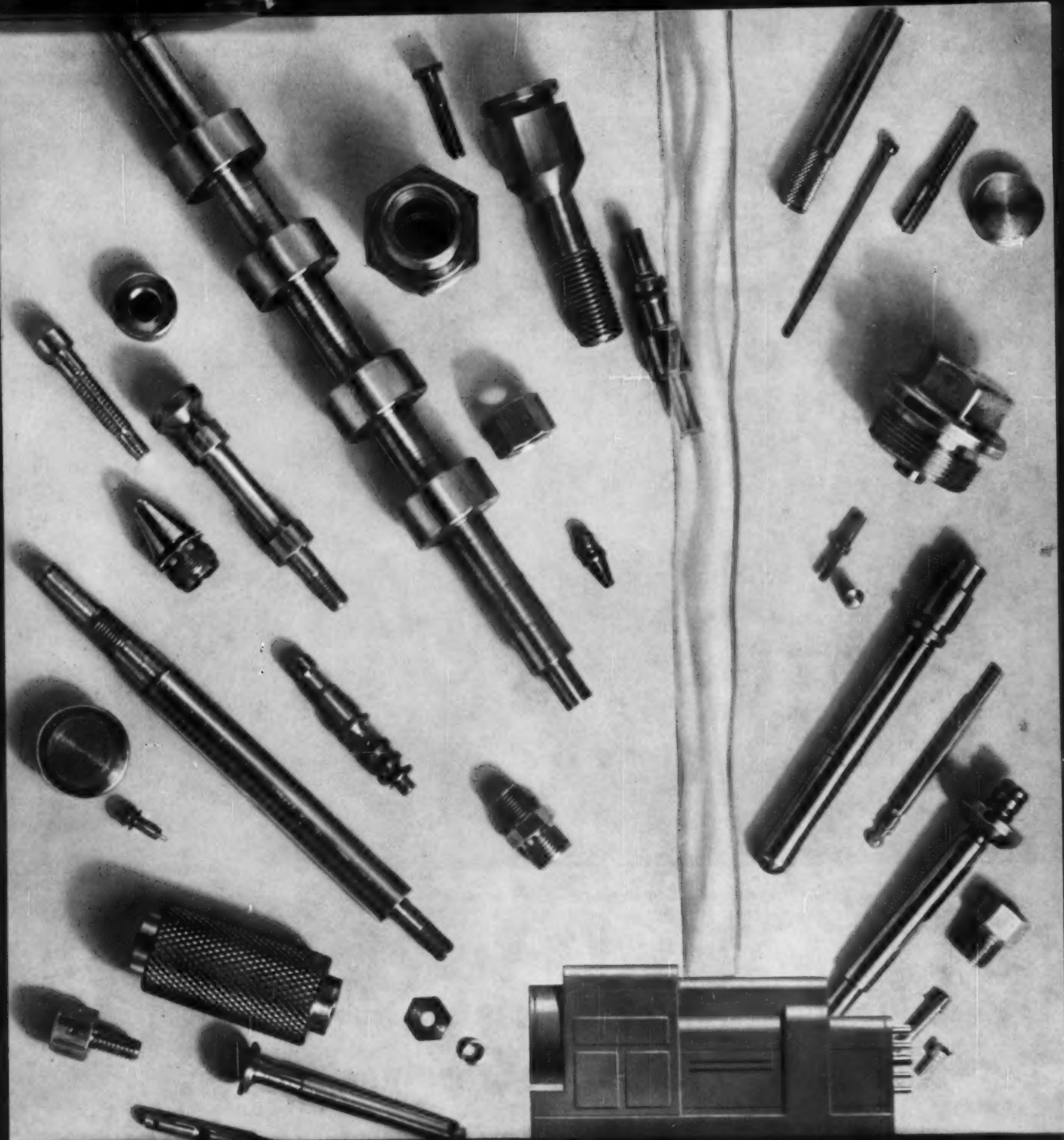


Previous contact tube design depended entirely on wire cast for limited contact; uncertain current pickup resulted. New-Longitudinal wires, brazed at one end, act as a chuck to insure positive contact.



Welding wire leaves the barrel through a nest of longitudinal wires. Wiping action assures stable arc performance even with aluminum and magnesium wires.

On the west coast —
Air Reduction Pacific Company
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**1/3 MORE PRODUCTION
FROM 7 OUT OF 10 AUTOMATICS**
with
the Texaco Cleartex Cure





3 TO 8 GALLONS OF LUBE OIL PER SHIFT leak into the cutting oil sump on 7 out of 10 automatics now operating. This cumulative reduction of cutting oil efficiency is actually to blame for many screw machine problems.

SHORT TOOL LIFE due to chip weld, cratering, burning, can often be traced directly to lube oil dilution of cutting oil effectiveness. Your

Diluted cutting oil causes costly troubles in automatic screw machines . . . short tool life . . . frequent downtime. Diluted cutting oil can be cured . . . forever! Prove it yourself . . . Start the

Texaco



saving in tool regrinds, tool replacement and downtime offsets the price of premium Clear-
tex many times over.

A CRITICAL SYMPTOM of cutting oil dilution in your automatic screw machines is excessive scrap production. Another, and earlier one to watch for, is frequent need to refill lubricating oil sumps.

HERE'S HOW: First, call in a Texaco Lubrication Engineer. Let him survey your automatic set-up—metals being machined, operating conditions, etc. Then, if your automatic screw machines are of the vast majority that can benefit from the Texaco Cleartex Cure, use a Cleartex Oil for *both* cutting and lubricating in just one machine as a test. On 70% of automatics in use today, men in charge of production and maintenance run into recurring troubles that they can actually cure with this one decision.

Cleartex Cure

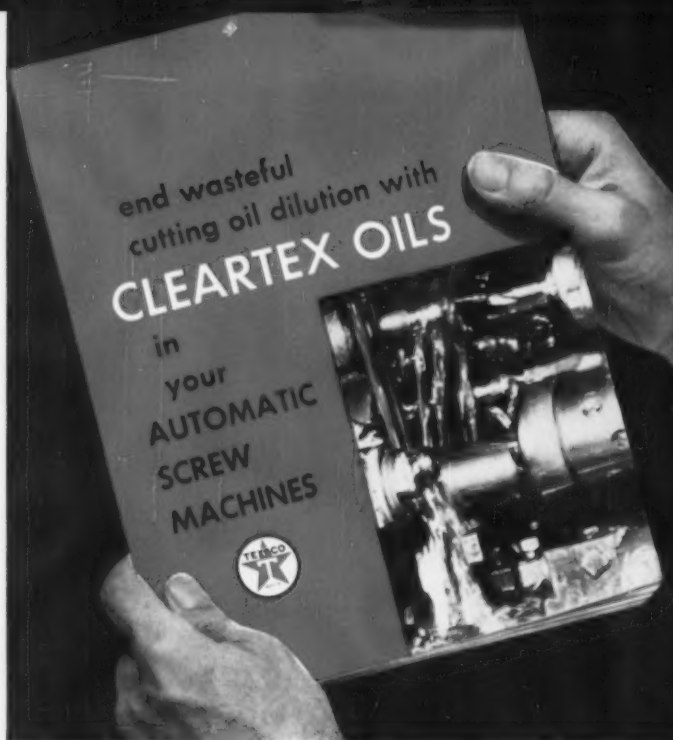
TURN PAGE FOR DETAILS OF METHOD



SEND FOR THIS NEW TEXACO BOOK NOW!

To do your job . . . stop waste and boost output . . . compete better on quality . . . you need to know what Cleartex Oils can do in automatic screw machines. This book spells it out.

See for yourself how Cleartex helps you reduce operating costs



How Cutting Oil Is Diluted

When lubricating and hydraulic oils leak into the cutting oil sump, the cutting oil is diluted. It loses strength; ingredients that make it an efficient cutting oil become less and less effective. This happens more frequently than is realized.

One way to make a quick check is to keep a record of how much lubricating oil (or hydraulic fluid) is being added to a machine. Lube oil make-up is a good measure of dilution on the cutting oil side and a sign that tool life and production is probably being lost.

Cleartex Cures the Problem

Texaco Cleartex Oils were developed to cure this problem forever.

The Cleartex Series are transparent, non-corrosive products. Despite their non-corrosive features, they do have relatively high extreme pressure properties, which make them well suited as general purpose cutting oils for use in a wide variety of operations where requirements are normal.

On non-ferrous metals, they are particularly effective because they are non-corrosive.

They are also excellent as machine tool lubricants and hydraulic fluids, principally because of their exceptional chemical stability, load carrying ability and rust preventing properties. Thus, they are truly efficient dual

or tri-purpose oils. In addition, Cleartex Oils have excellent odor, color, E.P. properties, corrosion protection.

How to Set Up a Test

Cleartex Oils are demonstrably superior to any dual or tri-purpose lubricants available today. It also seems apparent that the cost of operating 70% of the automatic screw machines can be reduced by the use of a Cleartex Oil. We say this because on automatic screw machines that now use the new Texaco Cleartex Oils for cutting, lubricating, and (if needed) hydraulic fluid, difficulties of short tool life, rejects and downtime have been cured, or definitely reduced.

Why don't you arrange with a Texaco Engineer to make a test on one machine—or on an entire line if you want to go for the savings immediately. Contact any one of Texaco's 2,000 Distributing Plants in the 48 States, or write to The Texas Company, 135 East 42nd Street, New York 17, N. Y.



LUBRICATION IS A MAJOR FACTOR IN COST CONTROL

(PARTS, INVENTORY, PRODUCTION, DOWNTIME, MAINTENANCE)



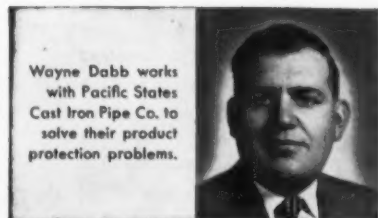
Call your AIM*... Pacific States Cast Iron Pipe Co. does ...
Acme Steel Strapping protects pipe shipments

PACIFIC STATES CAST IRON PIPE CO., PROVO, UTAH, wanted to improve arrival condition of cast iron pressure pipe shipped in gondola cars. So they called in their Acme Idea Man.

Together, they arrived at a bracing method using heavy-duty Acme Steel Strapping that virtually eliminated in-transit damage (Idea No. U3-2). Lengths of lumber are placed on the sides and bottom of a gondola car and four lengths of strapping are laid in position. Pipe is loaded and strap is tensioned and sealed, resulting in two secure units.

Now pipe arrives in damage-free condition and is faster to unload since orderly lading presents no unusual materials handling problems or hazards for consignee personnel.

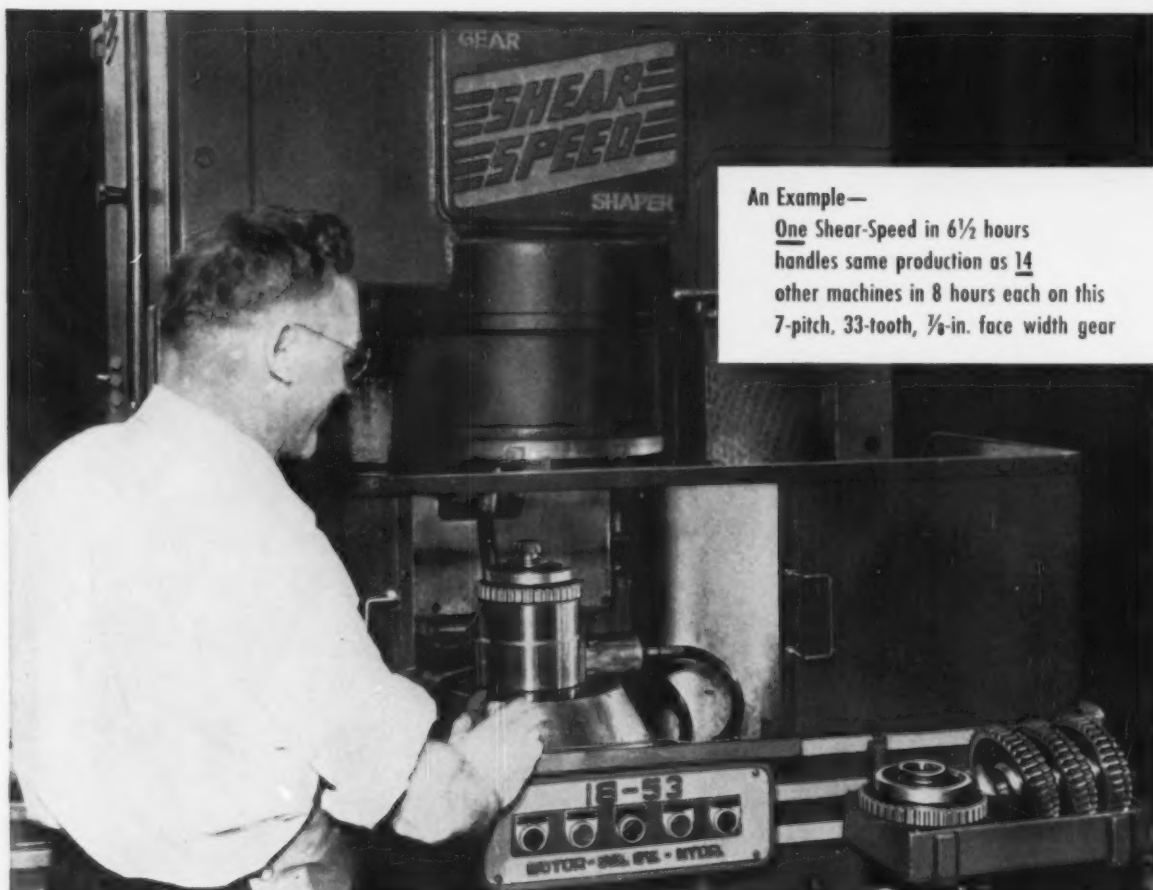
***Call your Acme Idea Man.** He has scores of time-saving, product-protecting ideas, many of which may help you. Write Dept. IFS-128, Acme Steel Products Division, Acme Steel Company, Chicago 27, Illinois. In Canada, Acme Steel Company of Canada, Ltd., 743 Warden Ave., Toronto 13, Ontario.



Wayne Dabb works with Pacific States Cast Iron Pipe Co. to solve their product protection problems.



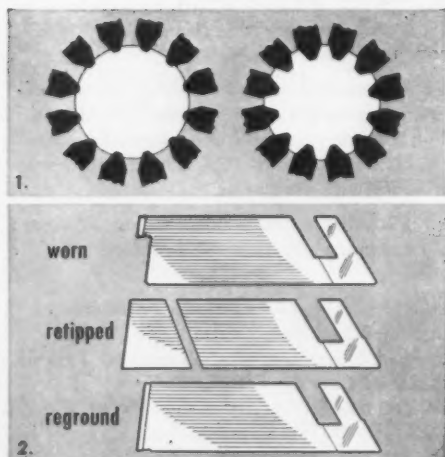
STEEL STRAPPING



An Example—

One Shear-Speed in 6½ hours
handles same production as 14
other machines in 8 hours each on this
7-pitch, 33-tooth, ⅞-in. face width gear

Boost your productivity with ***SHEAR-SPEED®*** gear shapers




1. In the Shear-Speed process all teeth are cut simultaneously. Gear-size capacity from 1 to 20 inches.

2. Shear-Speed cutting blades can now be retipped economically by new Michigan cost-cutting service.

If you're interested in higher productivity in your gear and toothed parts departments, the one sure process is Shear-Speed gear shaping—the one process that cuts all teeth of external or internal gears at one time in just seconds. Shear-Speed gear shaping is now the basic production method in a broad range of manufacturing fields—on gears, splines, sprockets, cams, ratchets, clutches, etc. New improvements now make Shear-Speed bigger cost savers than ever—with lower tool costs; easier automation. Other features: top accuracy, low maintenance and easy operation. Let a Michigan representative plot your toothed-part production against Shear-Speed time cycles. You'll be surprised at the productivity . . . and savings.



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IN CANADA: COLONIAL TOOL CO. LTD.



\$2027.00

what's a bar of steel worth?

Did you ever figure out what a bar of steel is worth?

Take this piece of steel, for instance. It's an ordinary round bar . . . selling price, \$13.76. But it could be worth the figure shown on the tag above.

Here's a typical case: One of our customers, facing a breakdown, ordered such a bar. A short time later it was delivered. An overnight delay would have cost this customer \$2,027.00 in time alone.

Whether you require a bar of steel or several carloads, the material can be worth no more than the service behind it and no steel service center has built a better reputation for dependable service than Levinson. If you call us or drop us a note, our salesman will be glad to tell you about our 30,000 ton inventory, about our 13 acres of fabricating and warehousing facilities all under roof, about our technical and engineering assistance. But most important, he will tell you about the people in the Levinson organization who are dedicated to giving you the kind of out-of-stock steel service you deserve.

Warehousers, fabricators, designers of steel for over half a century.

the **LEVINSON STEEL**

COMPANY

Pittsburgh 3, Pa.
Phone: HUbbard 1-3200



Vinson Steel and Aluminum Co.
Dallas, Texas says:

Adjustable Blade Clearance Allows Use of Shear for Complete Range of Thicknesses

Shearing capacity of this machine is 12'-0" x $\frac{1}{2}$ " mild steel. Note accessibility of two cranks on right end housing. Upper crank is for knife adjustment. Lower one is for back gauge adjustment.

THE feature that Vinson Steel and Aluminum Company likes best on their Steelweld Shear is the adjustable blade clearance. This permits them to use the one machine for their complete range of thicknesses. They go as low as 26 gauge galvanized material and up to $\frac{1}{2}$ inch mild steel and $\frac{1}{2}$ inch aluminum.

As a leading supplier of metal in North and West Texas, Vinson insists on cuts being sharp, straight and accurate. This requires that the blade clearance be correct for every thickness

cut. Because of the unique easy method of adjusting the clearance on Steelweld Shears, the adjustment can be made in seconds.

Another item which is impressive is the low maintenance cost. This machine has been in service for over two years, and the maintenance has been practically nil.

More and more warehouses are installing Steelweld Shears. Usually one will handle a range of work that would require two or more other type machines not built with a fast knife adjustment feature.




GET THIS BOOK!

CATALOG No. 2011 gives construction and engineering details. Profusely illustrated.

THE CLEVELAND CRANE & ENGINEERING CO.
4852 EAST 282nd STREET, WICKLIFFE, OHIO

STEELWELD PIVOTED BLADE SHEARS



... Results of a Superior Beginning

The countless parts and products made from Roebling high-carbon steel spring wire and flat spring steel have one thing in common... their superior quality. This, of course, is related to the inherent fineness of the materials.

The variety in which Roebling offers these spring materials is equally impressive. They are available in hard drawn, hard rolled, annealed or soft, tempered or untempered. Types include zigzag and no-sag wires; upholstery and mechanical spring wires; valve spring wire; clock- and motor-type spring steels and flat spring steels of all types and description.

Whatever the type, size or characteristics you require—Roebling can fit your needs exactly. You'll find that Roebling quality means maximum production from your machines and consistent uniformity in your product.

For spring wire and flat spring steel information, contact Wire and Cold Rolled Steel Products Division, John A. Roebling's Sons Corporation, Trenton 2, New Jersey.

ROEBLING

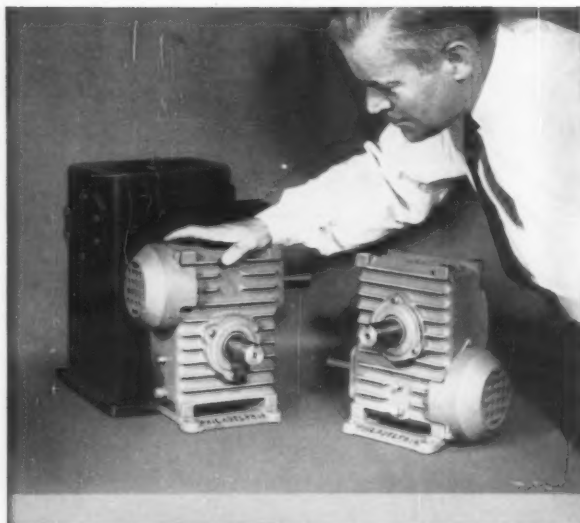


Branch Offices in Principal Cities—Subsidiary of The Colorado Fuel and Iron Corporation



Roebling... Your Product is Better for it

new high capacity fan cooled reducers take up 50% less space



LOOK AT THE SPACE YOU SAVE!

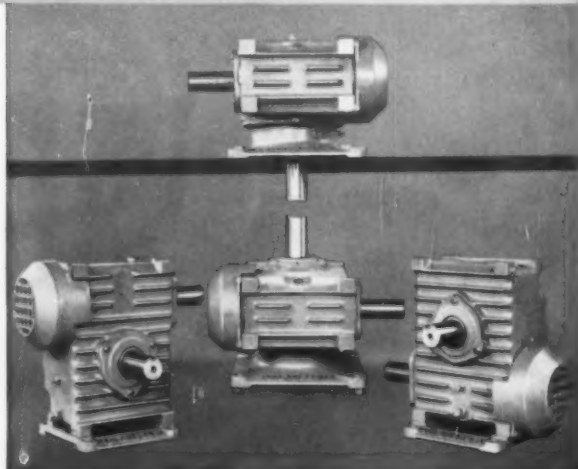
Think what this can mean to your products! You can make important savings in space and weight . . . in the neighborhood of 50% . . . depending upon output torque requirements. Or, you can design for heavier loads . . . up to 80% . . . without adding an ounce of weight to your product. You get more horsepower per dollar!

This new line of Philadelphia Fan cooled Worm Gear Reducers is available in 3, 3½ and 4" center distances for ratios from 5 1/6:1 to 60:1. Fan cooling, sturdy finned housings, improved tooth forms, precision ground alloy steel worms and special high strength bronze gears all combine to give you a drive that will handle heavier loads in less space.

STANDARD STOCK PARTS SIMPLIFY SELECTION.

These new fan cooled units have a degree of simplicity and flexibility never before available. Standardized housings, fans, gearing and mounting bases permit you to select any drive arrangement you need . . . permit us to give you prompt delivery from stock.

They simplify your design problems too. For Example: horizontal units can be furnished without mounting bases. Housings can be designed as an integral part of your product.



For more information . . . horsepower ratings . . . dimensions . . . construction details . . . write for your copy of Bulletin WG-583.

PHILADELPHIA GEAR CORPORATION

Erie Avenue and G Street • Philadelphia 34, Pennsylvania

philadelphia gear drives

Offices in all Principal Cities • Virginia Gear & Machine Corp., Lynchburg, Va.

INDUSTRIAL GEARS & SPEED REDUCERS • LIMITORQUE VALVE CONTROLS • FLUID MIXERS • FLEXIBLE COUPLINGS

RESEARCH AND DEVELOPMENT OUTLAYS are moving up. So says the Scientific Apparatus Makers Assn. It predicts that today's \$7 billion investment in research and development will hit \$12.5 billion by 1962 and a possible \$21 billion by 1967.

A MAJOR EXPANSION PROGRAM by American Motors is encouraging, but it does not forecast any capital spending boom. Third quarter spending was lower than predicted and planned spending for new plants and equipment is expected to climb only slightly in the first quarter of next year, government surveys indicate.

AN EARLY MISSILE DECISION on whether the U. S. will switch to a single type of strategic ballistic missile is expected in the Pentagon. Top brass now indicate they expect to base global war planning on ICBM types, phasing out 1500-mile range missiles.

FATTER PAYCHECKS AND RISING EMPLOYMENT are expected to provide a big boost to consumer buying. Not only are more workers on the job, with manufacturing employment up 200,000 in November, but weekly earnings are at a new record of \$86.58.

LINEPIPE SHIPMENTS WILL CLIMB following Supreme Court reversal of controversial Memphis decision. But it may be several months before the legal overturn is reflected in new linepipe orders. However, pipe mills believe 1959 sales of linepipe could equal 1957's record.

ALUMINUM MARKET DISTRIBUTION is basically unchanged this year, with little shifting of markets. An Aluminum Assn. report notes that the No. 1 market is still in building materials. It accounts for 22.5 pct of all wrought shipments. Wrought takes 75 pct of the total aluminum market.

TITANIUM FOIL IS NOW ON THE MARKET, both commercially pure and alloy. It was developed for the aircraft industry by Titanium Corp. of America. Market potential is still not clear, but its high strength, light weight and bulk suggest many possibilities.

MATERIAL HANDLING EQUIPMENT ORDERS have turned up again after a two-month slump. Material Handling Institute reports October orders were up nearly 26 points over September.

STAINLESS STEEL PRICES on bars, wire and billets were increased 3.75 pct by Crucible Steel Co. of America. Other stainless producers were expected to follow. Prices of plates, sheets and cold-rolled strip were not changed. Base prices of stainless steels were not changed Aug. 1, and the selective nature of the increases is attributed to varying market and production conditions.

3 new applications get longer life and minimum maintenance using Dodge pillow blocks with Timken® bearings

PICTURED below are three applications where Timken bearing equipped Dodge pillow blocks stay on the job with little attention under tough conditions. Their tapered design lets Timken® bearings take both radial and thrust loads in any combination. And full-line contact between rollers and races provides extra load-carrying capacity. Wear is reduced, maintenance is cut to the minimum.

Cutaway view shows the Dodge

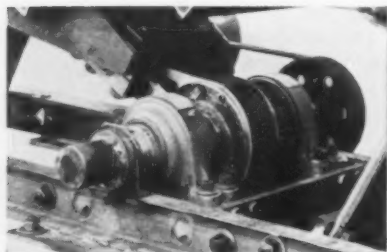
All-Steel pillow block with Timken bearing mounting. Of special design, the bearing has a tapered bore with self-aligning spherical outer surface—never needs adjustment.

Besides the All-Steel pillow block, other versatile Dodge pillow blocks with Timken tapered roller bearings are: Type "E", Double-Interlock, Type "C" and Special Duty. All are compact in design. Special thrust devices that take up extra space are not needed.

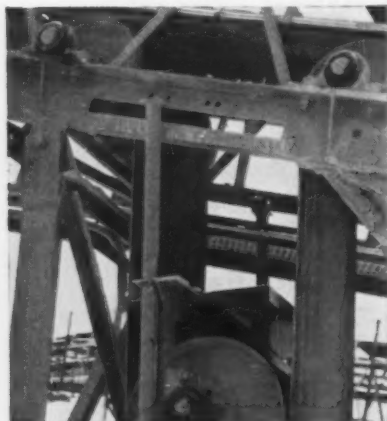
And to get the finest steel for Timken bearings, we make it ourselves—America's only bearing manufacturer that does. So specify bearings trademarked "TIMKEN" for the machines you buy or build. The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable address: "TIMROSCO".



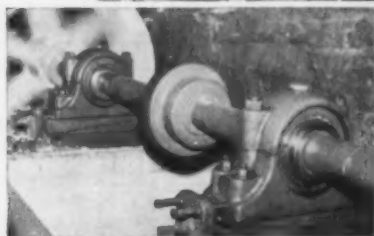
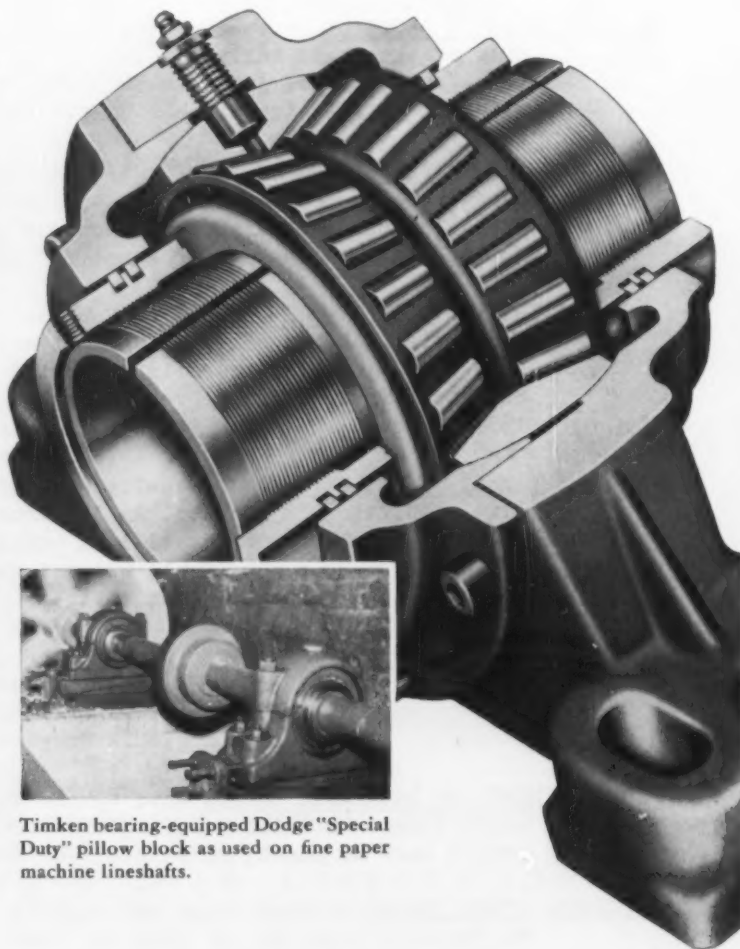
This symbol on a product means its bearings are the best.



Timken bearing-equipped Dodge All-Steel pillow block used in a vibrating conveyor.



Timken bearing-equipped Dodge Type "E" pillow block used in sand and gravel plant.



Timken bearing-equipped Dodge "Special Duty" pillow block as used on fine paper machine lineshafts.

TIMKEN

TRADE-MARK REG. U. S. PAT. OFF.

TAPERED ROLLER BEARINGS ROLL THE LOAD

Why Industry Shuns Michigan

Surveys leave no doubt that the mighty is falling.

The once unchallenged leader is coming off second best landing new industry. It has trouble holding what it has.

Here are the problems that must be met.—By H. R. Neal.

Michigan, whose industrial might once earned it the reputation of the "arsenal of democracy," is finding its reputation as an industrial leader challenged from all sides.

And it's having a tough time defending itself.

A recent study of the state's tax impact on industry found Michigan's business and industrial taxes higher than those in other industrial states.

Comparison — The study was conducted by Dr. Dwight B. Yntema, of Hope College, for a state committee. It shows the average tax on industries in other states, per employee, based on 100 pct for Michigan: 40 pct for Illinois, 53 pct for Indiana, 62 pct for New Jersey, 62 pct for New York, 44 pct for Ohio, 73 pct in Pennsylvania, and 82 pct in Wisconsin.

Another study released last month shows Michigan had a deficiency in industrial growth from 1947 to 1956. Dr. Charles L. Jamison, professor emeritus at the University of Michigan, compared the number of production workers in 14 industry groups.

"The state should have gained 270,663 production jobs during the period if Michigan industrial growth had kept pace with the average

rate," he says. "It actually fell behind the average to the tune of 228,136 production jobs."

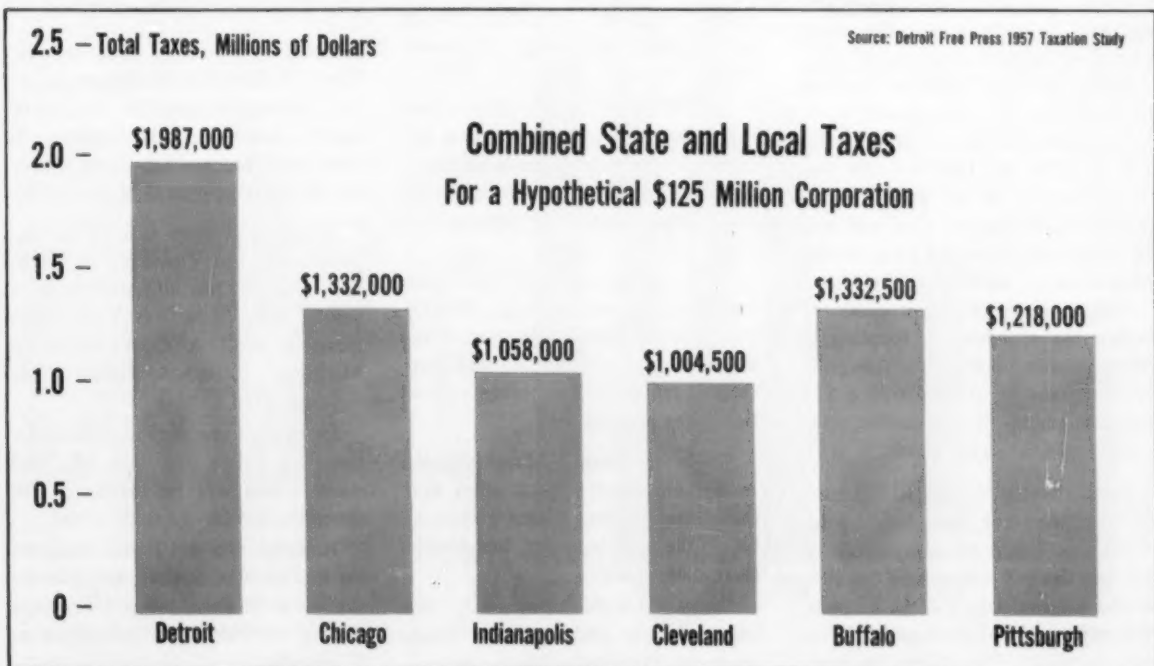
Fell Behind — Most important classification was transportation equipment, including automobile and aircraft manufacturing. Michigan, he said, lost production jobs in this category while the nation gained by 52.6 pct.

He decided the figures reveal a trend to move auto production closer to markets.

Michigan's neighbors, particularly Ohio and Indiana, are stealing her industrial might right from under her nose. Since 1946, General Motors has established 14 plants in Ohio. Ford had no plants in Ohio prior to World War II; now has nine.

Chrysler built the world's largest

How Tax Bite Hits Michigan Industry



How Job Opportunities Compare

Labor Market Indicators

Michigan

Battle Creek
Detroit
Flint
Grand Rapids
Kalamazoo
Lansing
Muskegon
Saginaw

D
F
F
F
C
D
F
E

Other Representative Cities

San Francisco
Cedar Rapids
Wichita
Buffalo
Cincinnati
Cleveland
Philadelphia
Kenosha

C
B
C
F
C
D
D
C

Source: Area classifications are Dept. of Labor indicators. They range from 'A' (Current critical labor shortage expected to last at least 4 months) through 'F' (Job seekers substantially in excess of job openings, situation to last at least 4 months).

stamping plant at Twinsburg, O., although the vast majority of its plants are still clustered around Detroit. It has five plants in Indiana, but will close one to move to St. Louis.

GM Status—Why are they moving out? A year ago, Harlow H. Curtice, then GM president, summed it up in a way that most executives agreed with:

"The level of business taxation in Michigan has already led us to locate new facilities in other states where taxes per GM job are less than one-half of the present taxes per job in Michigan. This will also be taken into consideration in the placement of additional facilities."

Other companies have cited the state's tax situation in locating in other states. Jones & Laughlin Stainless and Strip Div. built a \$16 million plant at Louisville, O., rather than Monroe, Mich.

Initial Saving—Mike K. Schnurr, division president, said the final decision was based on comparison of taxes in the two states, and because of the tax outlook. J & L, he said, realized an initial savings of \$70,000 in Ohio. The Ohio business

franchise tax was only \$5000. The same tax in Michigan would have been \$37,000 plus a business activities tax of \$38,000.

A state House Tax Committee recently suggested a tax reform plan calling for a state income tax. It would more than meet the state's deficit, while permitting a lowering of taxes imposed on business. Small and medium size companies would benefit most.

But Michigan needs more than tax relief. Partly through union demands for contracts based on those of the large auto companies, Michigan's wage rates are among the highest in the country.

The deaths of such Michigan-based auto companies as Hudson and Packard, decentralization of remaining auto companies, and continuing trend to integrating operations, has hurt too.

Wage Problems—Manufacturers in non-automotive fields often find themselves paying wages comparable to the auto industry, but double their competitors'.

Daisy Manufacturing Co., air rifle producer and long-time landmark in Plymouth, Mich., moved

to a southern state where it received tax concessions and could cut its wage rate nearly in half, to about \$1.25 per hour.

Blame—Some 34 pct of the nation's tool and die capacity is located in Michigan. Detroit alone has 28 pct. Most of this capacity is now idle. Shop owners place part of the blame on the integration policies of the large automakers. But they place most of the responsibility squarely with the UAW for forcing their wage costs up to the point where the independents pay about 45¢ an hour more than even the automakers.

There is another reason for the trek away from Michigan, particularly Detroit. Many of the plants are old and inefficient. Take the Dodge Main plant, for example.

It is nearly 50 years old, but economic and social reasons have kept it in operation. But the plant is now contributing to labor difficulties which could hasten its abandonment.

There are thousands of square feet of floor space in antiquated buildings standing vacant in Detroit. They have few inducements. Redevelopment programs should help, but not on the scale as the jobs they once represented.

Politics—Tied in close to the labor climate in Michigan as to seem nearly inseparable, is the political climate. Little happens in state government that doesn't bear the stamp of approval of the UAW.

Hope—But there is hope for improvement, too. Governor G. Mennen Williams has admitted there is smoke, even if he hasn't conceded there is fire. A Commission on Michigan's Economic Future is being organized.

However, specific recommendations are still a long way off. And what action will be taken, is still speculative.

Businessmen still make decisions on the basis of dollars, but also by the "seat of their pants." Few are willing to recommend Michigan as it is today.

How Much Gain for Linepipe?

Supreme Court Decision Gives Market Firmer Tone

It may take several months or more before High Court overturn of Memphis ruling is reflected in new linepipe orders.

But pipemakers believe linepipe sales in 1959 could return to 1957's peak level.

■ Linepipe mills and pipeline operators moved back toward solid ground last week with Supreme Court reversal of the Memphis decision.

The high court overturned a ruling that had jammed rate setting machinery for the gas transmission industry. By its reversal, the court restored to pipeline operators a degree of assurance about reasonable future earnings.

Background—The Memphis decision was handed down last November by a Washington court of appeals. The court held that the Federal Power Commission could not okay new pipeline tariffs without lengthy hearings unless customers agreed to the change.

Prior to the ruling FPC had been granting increases on a tentative basis after six months time. With this procedure held illegal, pipeline operators were open to refund claims totaling over \$200 million. The profit outlook on gas transmission became uncertain. Pipeline projects became unattractive risks for investors.

Immediately following the Memphis decision, pipeline projects began to lag. Steel mills began receiving holdups on pipe orders.

More Waiting Ahead—The Supreme Court action last week brought no rush of orders for linepipe. Republic Steel has received encouraging inquiries but does not expect these to be translated into

firm orders for several months. Yongstown Sheet & Tube expresses hope for an ultimate boost in linepipe and oil country sales.

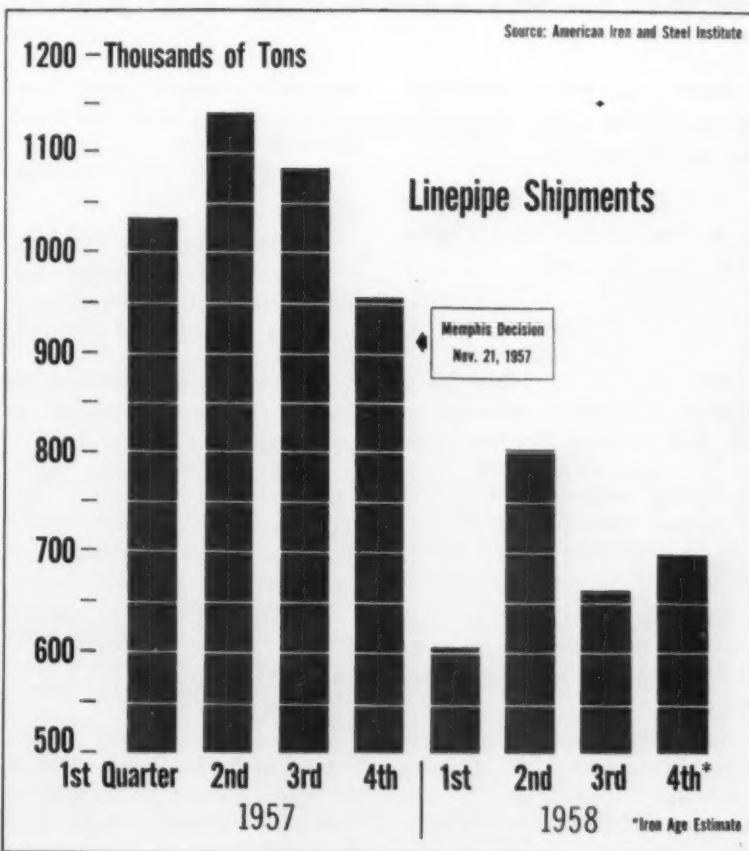
Another major mill feels it will be late 1959 or early 1960 before the decision produces actual orders.

Pipeline operators have expressed enthusiasm for the reversal, saying it will permit continued growth. But there is no mention yet of specific projects. Operators have informally indicated to the FPC they will be filing for tariff increases but again, the actual applications have yet to appear.

Back to '57 Levels—This does not mean the Supreme Court decision was not important. The ruling makes more certain a 500,000 ton increase due next year in steel used for gas transmission lines. It gives a firmer tone to linepipe orders that extend three and four years ahead.

Coupled with the general business recovery, the Supreme Court finding should raise pipeline construction and linepipe sales to the levels of 1957. It promises to remove much of the halting nervousness which has marked pipeline activity this year.

How Memphis Case Hurt Pipe





TIME SAVER: Blaw-Knox Co. uses Univac system to make computations for a complete high temperature

pipng system in less than an hour. During this time, operator watches for erratic signals.

Computers Are Paying Their Way

Doubts are lifting about the economics of using computers for engineering jobs.

They are proving themselves in certain design applications.

—By G. J. McManus.

■ Is there a commercial payoff in automatic engineering?

This question is being asked more often as electronic computers are applied to an ever-increasing number of design problems. Computers are being used in the design of nuclear reactors, controls systems, steam turbines, transformers, piping systems, and many others.

Opinions Are Changing—They are being used not just to speed computation but to make design decisions.

The problem is: Can you justify expensive computers for ordinary commercial engineering? A year ago the answer might have been "no." Today, strong advantages are

emerging for certain applications. In a few years, a broad field seems certain to open up.

Here are some of the considerations:

Four Major Points — 1. Computer economics are changing fast. The power of digital computers is increasing at the rate of about 10-to-1 a year.

2. One of the biggest benefits of computer engineering will be improved design. This will show up as lower production cost, better performance.

3. Improved customer service shapes up as an important computer advantage.

4. Direct manpower savings are unlikely with computers. Engineering workload will be shifted from routine to creative channels but not reduced.

Used in Motor Design—One of the most significant current applications of computers is at the East Pittsburgh plant of Westinghouse

Electric Corp. Here an IBM 704 computer has been put to work on the design of large induction motors. The motors are built to customer specifications. Individual orders almost always require considerable design work.

A Westinghouse team under G. L. Godwin devised a method for the complete design of induction motors on a computer. The method surveys a wide range of design combinations. It selects the most efficient design for customer specifications. It prints out full manufacturing directions and performance specifications.

Big Time Saver—Data preparation takes about 10 minutes and can be done by a technician. Computer time is 12 minutes. In one recent test, the design group started cold with a list of specifications. A half hour later it turned out a complete, detailed design.

This compares with about one week's time required for the

average comparable design with conventional methods.

The speed of computer design offers a number of important service advantages. In negotiations preceding a sale, the customer can be given extensive design and performance data. In the period prior to production, customer questions on installation data can be answered quickly and easily. In times of peak demand, the computer is expected to eliminate delays caused by engineering backlogs.

How About Quality? — Closely related to speed is the question of design quality. In the Westinghouse system for large motors, the computer considers 6 major design variables and 50 material variables. Comparisons are integrated within the computer to give a design that is optimized.

With ordinary engineering methods, the time for such a thorough exploration would be prohibitive. Because of its speed (2½ milliseconds to solve two simultaneous equations), a large computer can survey every hopeful design possibility. In addition it has the advantage of following a design principle set up by the best engineering brains available.

Man vs. Machine — The result figures to be more efficient design. Mr. Godwin estimates the computer averages about 10 pct better than a competent designer. In some comparisons, computer design has shown a 20 pct efficiency gain. In others it has yielded no cost saving. The difference will vary with the degree of conservatism shown by the designer.

What these savings mean in production costs is hard to pinpoint. A 1-in. reduction in core length on a large motor saves about \$100. A 10 pct efficiency gain can cut production costs by 5 pct.

Costs Coming Down—When the Westinghouse design program was completed a year ago, the cost on an individual order was about 50 pct more than with conventional engineering.

Building Still Tops Aluminum Market

■ There has been little change in the aluminum mill products picture this year.

The latest Aluminum Assn. report, covering the first half of 1958, notes no significant changes in the percent of wrought products shipments being used by various markets.

Some Order — There was some shifting in the share of the permanent mold and sand casting shipments accounted for by the leaders. But their order of importance is unaltered.

Building materials is still king of the markets. It accounted for 22.5 pct of all wrought products shipped in the first half. And wrought products are over 75 pct of the total aluminum mill products market.

Shift — Distributors and jobbers took the same 15.1 pct of wrought shipments as in the previous period. But transportation dropped from 15.8 pct in the last half of 1957 to 13.9 pct.

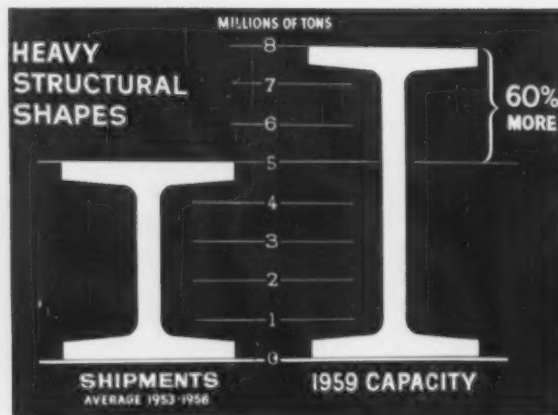
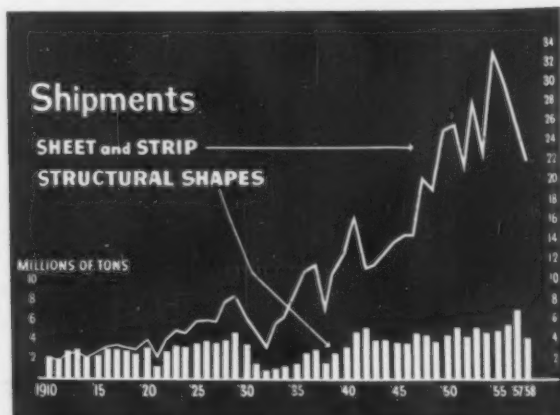
Motor vehicles continue to be the big gun in the permanent mold castings market. These users took 57.9 pct of shipments in the first half of the year. But this is down from the 69.8 pct they bought in the last six months last year.

Sand Castings — Industrial and commercial machines, equipment and tools solidified its position as the No. 1 market for sand castings. This market took 42.8 pct of the first half shipments compared to 34.7 pct in the last half of 1957.

Where Aluminum Goes

Markets	Pct of Total Aluminum Wrought Product Shipments for Six-Month Periods Ending:				
	June 30, 1958	Dec. 31, 1957	June 30, 1957	Dec. 31, 1956	June 30, 1956
Building Materials.....	22.5	22.3	20.6	19.2	19.0
Consumer Durable Goods.....	9.9	9.1	10.5	10.3	13.0
Transportation.....	13.9	15.8	18.3	16.6	17.4
Electrical.....	10.3	10.2	8.9	8.2	7.8
Machinery and Equipment except Electrical.....	4.0	4.0	5.5	4.7	6.2
Containers and Packaging.....	7.7	8.3	8.5	6.7	4.4
For Conversion into Primary Products.....	11.3	9.4	8.7	8.9	9.7
Distributors and Jobbers.....	15.1	15.1	15.2	16.9	16.7
Exports.....	1.3	1.5	1.3	0.7	0.9
Military.....	0.6	0.8	0.9	1.0	1.0
All other identified end uses....	2.0	2.2	2.5	2.7	2.4
Unidentified end uses.....	1.4	1.3	1.4	2.1	1.5

Structural Capacity Tops Demand



FLAT-ROLLED DEMAND soared as structurals inched up. Latter's capacity has just received big boost.

Structurals Enter Era of Plenty

Structural steel capacity is up. Suppliers see no shortages on the horizon.

Recent gains by concrete have steelmakers sharpening new research and engineering tools.

■ For about a year now, the men who make structural steel and fabricate it have been worried about the inroads of concrete construction. Triggered by the structural shortages of some recent years, many a job went to poured-in-place concrete. Others went to the young prestressed concrete industry.

How much was shortage induced, how much otherwise, is an unknown factor. But last week Bethlehem Steel—which was practically founded on wide flange structural shapes—kicked off a drive to do something about it.

Research is key—It will be the No. 1 weapon. Sales and advertising will be tied in. The American Institute of Steel Construction, the fabricators' group, has boosted dues to launch a major educational effort with state engineers, code authorities, etc.

For industry and the public, the results should be less expensive steel structures, less waste of manpower and materials.

Ready now—Good research ammunition is already on hand, some of it provided by Lehigh University's Fritz Engineering Laboratory. One significant discovery there: Because of the "factor of ignorance," welded plate girders are heavier and more expensive than necessary.

Another project is to get codes revised based on tests which prove that we are not taking advantage of the proven value of high strength bolting.

Most challenging of the "new" research ideas is plastic design.

It's a concept which requires fewer calculations, shows up the inefficiency of present methods of designing steel structures. Today's allowable stress incorporates a factor of safety against elastic limit; members are designed to be stressed only in the elastic region, and not above the yield point. But such members can be stressed above that point into region where they deform plastically—and without failure.

Saves steel—The reserve strength

which beams have even during plastic deformation can be used. A continuous beam using this principle weighs 20 pct less than current elastic design requires. In a simple beam the comparable saving is 67 pct.

The theory is new only in this country, where some 20 structures use it. There are 600 single story structures in England which were designed by the plastic method, plus a four-story and a five-story office building.

How about supply?—Will the steel be available? Yes, says R. E. Wilmot, Bethlehem's manager of structural shape sales. He noted that since 1953, expansion of structural shape capacity at two Bethlehem plants, two U. S. Steel plants and at Inland Steel will mean 1959 capacity almost 3 million tons above average shipments for 1953 through 1958 (see chart).

And fabricators are mechanizing to cut costs and speed deliveries. Example: Lehigh Structural Steel Co., Allentown, Pa., has developed a machine which will drill 18 vertical holes at a time in steel plate which may be up to 12½ ft wide, 120 ft long and 3½ in. thick.



**J&L
CONTROLLED-QUALITY
SPRING WIRE**

The Universal Wire Spring Company, Bedford, Ohio, uses high carbon MB spring wire from 7½ to 12½ gauge in these new Uniflex springs.

**"J&L's spring wire speeds production
of new Uniflex springs"
...states Universal Wire Spring Co. official**

"We have to fold springs tighter than ever to adapt them to the narrower spaces available in modern designs. The spring wire used for our sinuous corrugated Uniflex springs must then be exceptionally uniform in tensile strength and resistant to deflection under load, and J&L's spring wire has consistently been of this quality," reports a Universal purchasing executive.

J&L achieves this uniformity in spring wire through rigid quality controls in every phase of production from ore mine through finished product. Only first-class

quality controls at the steel mill, in balancing chemical analysis, heat treating and drafting, can guarantee uniform spring wire for modern volume production. Every coil of J&L wire is thoroughly tested for uniformity of physical and dimensional characteristics. The resulting high quality speeds production and reduces rejects in automatic operations such as those of Universal.

Call your J&L representative for your next order of spring wire. Or write to Jones & Laughlin Steel Corporation, 3 Gateway Center, Pittsburgh 30, Pa.



Jones & Laughlin Steel Corporation

PITTSBURGH, PENNSYLVANIA



FOIL: Titanium Corp. of America developed foil for the aircraft industry. Now its market researchers are probing instrumentation, electronics, and precision parts makers as other possible markets.

Titanium Foil Arrives

■ There's a new titanium mill product on the market. You can now buy titanium foil in either commercially-pure or alloy form.

Alloy foil officially joined the Titanium Corp of America product line late in October when the first coil was shipped to a buyer.

Late in 1957, Convair Div., General Dynamics Corp., asked TMCA to roll some commercially pure titanium foil for use in honeycomb structurals in the B-58 supersonic, medium-range bomber.

Development—TMCA rolled the foil and sent it along. It wasn't strong enough for this particular job. TMCA did some testing and found they could roll alloy foil on standard Sendzimir mills with no major problems. They whipped up a new batch of foil, this time alloy Ti-6Al-4V, which they felt sure would do the job, and sent it to the Convair subcontractors.

The company is now offering foil

coils from .000125 in. to .010 in. thick, in widths from 4 in. in the thinner gages to 36 in. in the heavier. Cost of the alloy foil differs by alloy. A coil of commercially pure, 1022 ft long, .000125 in. gage, 4 in. wide costs about \$82.

What's Ahead—The item is a little too new, and was developed in too much of a hurry for the company to have a clear idea of its potential. Some of the technical staff suggest good immediate markets should be for capacitors, rectifiers, metal-ceramic electronic tubes and camera shutters.

It's not expected to become a big tonnage item. A midwestern manufacturer makes parts for 40,000 mercury switches from 2 lb of titanium foil. But since there are no special techniques or equipment needed it is expected to be a profitable item.

NMTBA to Washington

The National Machine Tool Builders' Assn. will move its headquarters from Cleveland to Washington, D. C. No target date has been set for the shift yet.

The move has been approved by the directors of the group. But before it leaves town, the association must sublease its present Cleveland quarters.

Ludlow King, executive vice president, said he hoped the matter would be settled in time for NMTBA to move into Washington by late in 1959.

The Goose Is Dead

The Goose is gone. Dropping of this device from the Air Force missile program leaves the Green Quail as the only strategic decoy missile.

Ditching of the Goose project was hinted early in December, when the Air Force stopped work on launching bases for the missile. Altered operational planning is the reason given for canceling the missile.

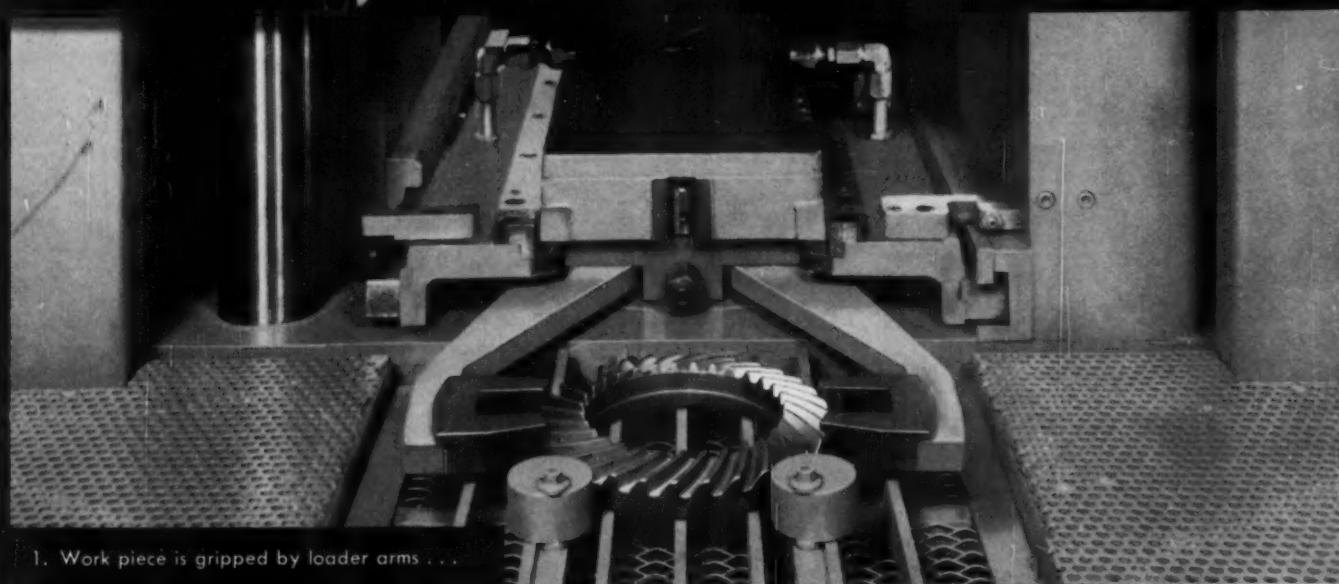
Even the Green Quail, may not figure in Air Force plans much longer. There are indications that the planners, to allow spending on other projects, intend to drop any flying device that doesn't provide a bang. The decoys, though well conceived, now are considered luxuries.

Predicts Banner Year

Next year will be a banner one for makers of porcelain enameled curtain wall panels if M. Jesse Salton, president, Seaporcel Metals, Inc., is right.

He predicts up to a 20 pct increase in business for architectural porcelain enamel products.

Mr. Salton says improved manufacturing facilities for porcelain panels have cut their cost, making them competitive with other materials traditionally used for exterior walls.



1. Work piece is gripped by loader arms . . .



2. . . . which move piece to quenching die . . .



3. . . . where controlled flexing relieves strains before quenching.

New Gleason machine quenches gears 3 times faster with minimum distortion

The unique, fully automatic method incorporated into the new Gleason No. 117 Quenching Machine makes it possible to quench gears and other parts faster than ever before without significant distortion.

The machine discharges a piece every 30 seconds; accommodates 17 pieces in process at one time.

Automatic handling. Once a part is deposited at the front of the machine, the No. 117 positions it on a quench-

ing die and then clamps, flexes, and quenches it. Initial quenching takes only about ten seconds.

When the part cools past the critical hardening temperature, it is released from the dies. Still immersed in oil, the part then cools completely as it travels on a conveyor to the unload chute. As soon as part is released from dies, the machine is ready to receive another work piece.

Flexing before quenching. Each hot part is flexed between the dies to relieve internal stresses. Rate and number of flexes are easily preset. Hydraulic pressure produces positive diaphragming action.

Pulsing. All pressure on the work is pulsed momentarily throughout the

die-quench. This permits work to contract without strain. During the die-quench, oil flows uniformly over and around the part.

Faster production. You can speed up production materially with the Gleason No. 117 Quenching Machine. It handles ring gears and cylindrical parts up to 10½" in diameter and 8" high. You can connect it with any conventional furnace so that parts are automatically fed to the quenching press. Push-button controls and timers are adjustable and easy to set. Dies can be changed quickly and easily.

Gleason engineers are ready to help you step up productivity with this new machine. For complete details, write for bulletin.



Gleason No. 117 Quenching Machine



GLEASON WORKS

Builders of bevel gear machinery for over 90 years
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Lithium alloys for thrifty metal makers

The wonderful thing about these *property-boosting* lithium alloys is that they call for so little lithium. In many cases, the addition of a few ounces is all that's needed to tip the scales toward . . . more desirable physical properties, better grain structure, improved cold working characteristics,

and many other features. Needless to say, the addition of lithium can't improve *every* alloy. But where it does, its cost is infinitesimal compared to the advantages it gives. Just look over the few examples given here. You'll find that lithium is an alloying metal well worth investigating.

To find out more about lithium metal (99.9% pure) and what it might do for you, write for Bulletin 101. Address letterhead request to Technical Literature Department, Foote Mineral Company, 438 Eighteen West Cheltenham Building, Philadelphia 44, Pennsylvania.

Magnesium-Manganese-Lithium

80-98% MAGNESIUM
1-10% MANGANESE
1-10% LITHIUM

As little as 1-10% lithium in the above alloy gives greatly improved cold working properties. As cast, this alloy can be cold worked to 60% reduction; after annealing, it can be cold worked to 95% reduction.

Zinc-Lithium

96.5-99.8+ % ZINC
.1-2% MANGANESE
.05-1% NICKEL
.005-5% LITHIUM

The percentage of lithium used to refine the grain structure of this zinc alloy works out to as little as 1 pound of lithium to every 1000 tons of zinc. This amounts to about 1¢ per ton!

Aluminum-Lithium

84.15% ALUMINUM .75% MANGANESE .1% LITHIUM
12% ZINC .5% IRON
2% COPPER .5% SILICON

The physical properties of this aluminum alloy are reported to be superior to the better known, high-strength aluminum alloys. The presence of the lithium improves its physical properties and correspondingly decreases its density.



FOOTE MINERAL COMPANY

LITHIUM METAL, CHEMICALS, MINERALS • ELECTROLYTIC MANGANESE METAL • NITRELMANG • HYDROGEN-REMOVED ELECTROMANGANESE • RIMEX
MANGANESE SULPHIDE • WELDING GRADE FERRO ALLOYS • COMMERCIAL MINERALS AND ORES • ZIRCONIUM, TITANIUM, HAFNIUM (IODIDE PROCESS)

Paul V. Fly

Drawing Tubes to Fit the Atom

Atomic energy and missiles are creating a new breed of custom suppliers.

One of these is the tube drawing industry, in which Mr. Fly is a specialist.

■ When the submarine Nautilus made its now-famous journey under the Polar icecap, a little bit of Paul V. Fly went with it. Mr. Fly is executive vice president of Tube Methods Inc., Bridgeport, Pa., a company that has helped develop stainless steel tubing for the Navy's atomic submarine program and other nuclear energy and missile projects.

He is justifiably proud of the fact that TMI tubing is used in the steam generators in the world's first atomic power plant at Shippingport, Pa.

Emphasis on Precision—Mr. Fly and his company are among the first in a new category of industry—the custom suppliers to research and development. These companies help bridge the gap between laboratory experiments and actual production.

In the case of TMI, its contribution is in the field of cold drawing of stainless and alloy tubing to precision requirements.

Needed for Missiles—"We make nothing else," explains Mr. Fly. "We are the 'jewelry' end of the tubing business." In missiles, for example, tubing is the heart of the missile motor. Diameters of tubing are as small as 0.010 in., wall thicknesses are as fragile as 0.003 in., and tolerances frequently are as fine as 0.0005 in.

Paul Fly attributes TMI's success to the initiative and leadership of the late Nathan H. Wolf, who or-



PAUL V. FLY: In the 'jewelry' end of the tube business.

ganized the firm in 1941 and was its president until his death last May.

The Road Up—Mr. Fly, who is 46, started as a bench hand with Summerill Tubing Co. more than 30 years ago. Orphaned when a child, he was raised by relatives and went to work early to help make ends meet. He went to night school for nine years, studied metallurgy, business administration, and accounting. On weekends, he played trumpet in a dance band to help pay his tuition.

At Summerill, he worked his way through the mill and eventually became production manager. In 1945, he joined TMI.

His Outlook—"As long as we continue to develop scientifically, the tubing industry will grow," says Mr. Fly, "because tubing provides the simplest means of transporting liquids and gases under high pressure or temperature." Paralleling this need is the increasing demand for precision tubing by the electronics industry.

When and if the U. S. succeeds in getting a missile to the moon, it may well be one of those equipped with tubing manufactured by TMI—an organization that seems to have a knack for becoming involved in the history-making scientific achievements of our time.

how standard
AISI-SAE

**MOLY
CARBURIZING
STEELS**

help Pontiac
3 ways



After extensive testing, Pontiac adopted the 4520 type for ring gears and pinions in its 1956 model and has used this grade ever since.

IN PURCHASING

AISI-SAE 4520 is more economical than the previously used carburizing steel with lower molybdenum content.

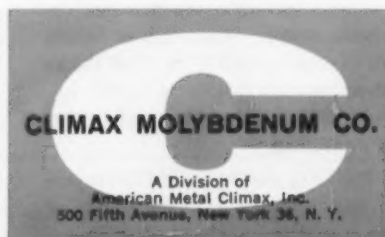
AISI-SAE 4520 is now a standard grade. Ask your regular steel supplier about it.

IN PRODUCTION

AISI-SAE 4520 has machinability commensurate with the previously used carburizing steel and can be annealed with a simpler practice.

IN QUALITY

AISI-SAE 4520 gives a higher case hardness after carburizing and quenching than the previously used carburizing steel.



You'll Need the Tools to Compete

American Motors' spending program is a case in point. To compete today you need the tools that guarantee efficiency in the plant.

The message isn't getting through to everybody. Surveys indicate little improvement ahead in capital spending.

■ Most of the business world got an emotional lift from American Motors' announcement of its new expansion program. (See *Automotive*, P. 67.)

For one thing, there is the natural tendency to sympathize with the little giant of the auto industry. After competing on their own terms with the real giants, and successfully, it now feels the need to expand while others are complaining of excess capacity.

More and Better—Of course, not all of the spending will go to increased capacity. A lot of AMC's facilities are in need of modernization and probably much of the program is aimed at improving, as well as enlarging, productivity capacity.

Obviously, AMC has more at stake in its program than turning out a larger number of Ramblers. George Romney and his compact staff at AMC know they will have to turn them out more efficiently if they are to meet the threat of the Big Three plunging into the "light" car field.

Efficiency a Must—This underlines one very important fact. The companies in metalworking that intend to stay in business have to be able to compete in manufacturing efficiency. AMC knows this.

It might be significant to point out that new buildings and facilities are nearing completion at Chevrolet's Willow Run plant, where best guesses indicate the new "light" GM car will be assembled.

But in spite of this mild round of capital spending in the auto industry (mild, that is, compared with the 1954, 55, 56 spending spree), there is little to cheer in the capital spending program.

Appropriation Down—You will recall that appropriations for capital expenditures in the first half of this year were pretty discouraging. (See *The IRON AGE-National Industrial Conference* quarterly survey of capital appropriation, Nov. 27.) Recent indica-

tions are there is only a very moderate improvement ahead.

The latest survey of capital spending intent, conducted jointly by the Dept. of Commerce and the Securities and Exchange Commission, has very little good news.

It shows, for one thing, that earlier surveys of "intent" were misleadingly optimistic; that actual appropriations were below announced plans. This downward adjustment of actual spending from advance plans has been consistent throughout the past year.

According to the survey, the rate of capital spending for the first quarter of 1959 is expected to be only a little above the rate of the second half of this year.

Workers Back, Paychecks Up

Looks Good—You are now able to get a fair evaluation of the national employment picture. Overall, it looks pretty good, but isn't up to 1956 and early 1957 standards.

Because strikes were settled in several major companies, employment rose significantly in November, a trend that is contra-seasonal. Another factor is the big auto production surge that resulted in many call-backs.

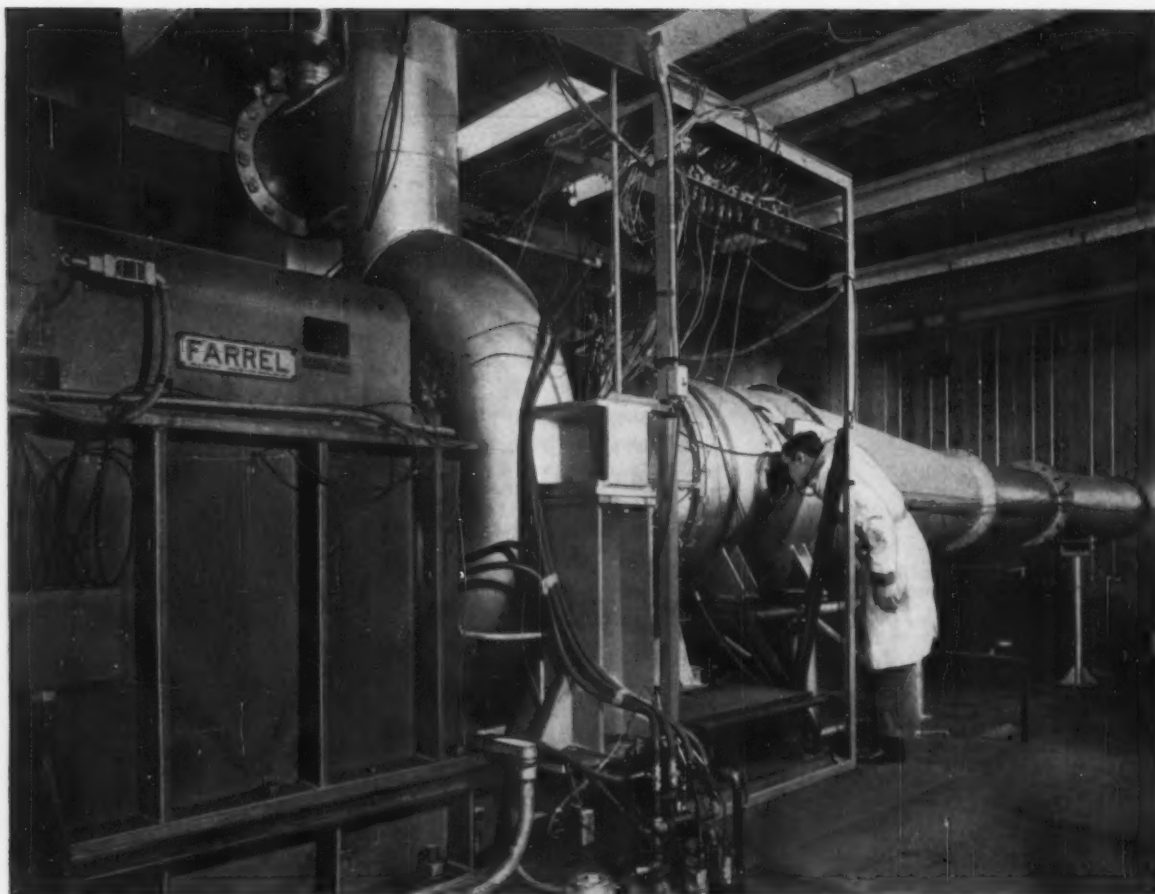
Record Weekly Wage—Putting some of the figures together, the Dept. of Labor has some encouraging totals. These mean a lot more money is being pumped into the economy in wages, and that consumers should continue in a good frame of mind when it comes down to making those "discretionary" purchases.

During November, non-farm employment rose 200,000, to a respectable 51.3 million total. In addition, the factory work week rose to 39.9 hours from 39.7 hours.

Increases in work week plus increases in hourly earnings brought weekly earnings by factory workers up \$1.62 to a record high of \$86.58.

Some Spots—However, there are some flaws in the employment situation. Unemployment remained unchanged at 3.8 million between October and November. On the other hand, this is the time of year where unemployment tends to increase because of seasonal factors. So in this case "no change" is considered a good sign.

But the spots of unemployment continue to hurt and evidence grows that jobs in certain industries are not coming back to 1951 levels.



Special gear unit for Lycoming test stand provides **SPEEDS UP TO 27,429 RPM**

This high-speed gear unit was specially designed by Farrel for use in a testing program at the Lycoming Division of Avco Manufacturing Corp. It connects a Dynamatic eddy-current coupling, driven by an Allis-Chalmers motor, with Lycoming's gas turbine compressor.

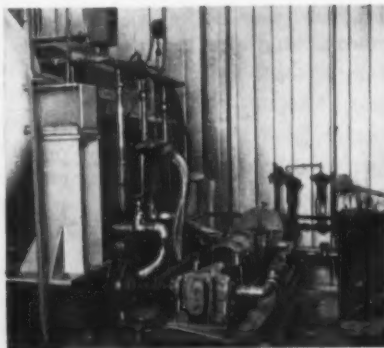
A special feature of the speed increaser is an air-actuated shifting mechanism to change the gear ratio for testing two different size compressors. With a maximum input speed of 1148 RPM from the coupling, output powers and speeds are 5000 HP at 20,111 RPM and 2500 HP at 27,429 RPM.

Other features include a horizontally locked gear train, which provides a more compact arrangement than the conventional design...herringbone gears and pinions, precision-generated by the Farrel-Sykes method...and a pressure lubrication system.

Farrel specializes in the design of gear units to meet unusual conditions of service and has the proven ability to provide the solution to your particular problem. Bulletin 451 will give you further details.

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A pressure lubrication system was furnished to lubricate and cool the gears and bearings, while operating within the speed range of the test.

Farrel-Birmingham®

FB-1154

Costs Drop When Indirect Labor Is Brought Under Control

By Harold B. Maynard—President, H. B. Maynard & Co.

Indirect labor is a last frontier in the plant where sizable cost savings can be made.

This report outlines scientific management approach to the problem, plus down-to-earth fundamentals of attacking at the source.

■ It's frequently stated that a worker is just as efficient as management plans for him to be.

In this respect, an excellent job has been done planning for the efficiency of productive workers. But, by and large, this is not the case for indirect workers.

Cost-Cutting Area—The result is that an important last frontier for cost reduction remains—in controlling and trimming indirect labor costs. Indirect labor includes such jobs as maintenance, storeroom work, janitorial work, carpenter

work, largely non-repetitive work that is difficult to measure and to control.

There are countless opportunities to reduce costs in these areas. But to obtain them, it is necessary to change from the traditional acceptance of indirect labor as a necessary evil about which little can be done, to an aggressive attack on the problem which will reduce indirect labor costs and bring them under control.

It's Not Easy—The only real reason indirect labor costs are not controlled in many companies is because the effect is not made to control them. Obviously, it is easier to deal with direct labor work, which is usually repetitive.

In contrast, indirect labor is largely non-repetitive, not so easy to understand. Studies of repetitive work and the development of time

standards accurate to the fourth decimal point are commonplace. But measurement of indirect labor is usually dismissed as not practical or profitable. Thus, an opportunity for substantial cost reduction is missed.

Let's look at it this way. The highest cost man in a department may be the laborer rather than the most skilled mechanic. The mechanic may get \$2.50 per hour, and the laborer only \$1.50. But if the laborer is busy only half the time, as is too frequently the case, his true cost is \$3.00 per hour.

Steps to Take—There are four general steps to take in controlling indirect labor costs:

First, is the proper organization of the work to be done.

Second, is the development of methods by which it will be done.

Third, is the establishment of



Authority on Scientific Management

■ Harold B. Maynard is a specialist in scientific management.

And probably one of his biggest contributions is his success in applying scientific management to areas that have resisted any application of scientific principles.

One of these areas is indirect labor, which most managements tend to regard as a fact of life, and then forget about it. This attitude is wasteful and costly, he says.

In bringing indirect labor and its costs under control, Mr. Maynard is one of the originators of Methods-

Time-Measurement, MTM, a technique used to set work and production standards based on predetermined time units for manual motions.

He has also developed other methods and techniques for reduction and planning controls, organization, administration and training. He is a professional engineer and has an honorary degree of Doctor of Laws. He has received many honors for his contributions to scientific management and has held top offices in professional groups.

time standards.

Fourth, is the final application of these methods and standards.

Get Organized—The first factor, proper organization, includes such obvious things as planning, scheduling, dispatching, work routines, and performance records.

In maintenance, for example, the work itself must be well-organized. Studies of the kind and frequency of work done will often indicate that certain kinds of work should be done on a routine, preventive basis.

Preventive routines can be planned and standardized, and performed when a shutdown of equipment will not be required. They simplify the standards-setting problem, for, because they are repetitive in nature, the same standards apply over and over again.

How It's Done—In establishing methods, the indirect worker should be given a definite task to do in a definite manner. The importance of methods study on direct labor operations has long been recognized, but it's just as important in the case of indirect labor.

You can establish with reasonable exactitude the methods you wish to have followed. But too frequently people are hired who have only some degree of familiarity with the work they are to do and who are let decide how they are going to do it.

Once a good methods engineer applies his analytical methods study procedures to indirect labor operations, he is almost always able to develop much better methods than have been in practice.

Must Be Taught — But good

methods must be taught to workers if they are going to use them. This is another step that is too often overlooked.

It is by no means unusual to find indirect workers who have received practically no training on the work they are doing. Not long ago we were developing a training program for a group of maintenance workers. This group, men with 10 years or more seniority, agreed they needed training on correct use of such elementary tools as the hammer, screw driver, or file before going on to the more intricate phases of maintenance work.

Management was surprised, of course, but reasons were clear. The company had never done any maintenance training of any sort. The more experienced men were supposed to do the training. But since no one had ever trained them, they themselves did not understand the work too well. The lack of training prevails throughout all areas of indirect labor.

Establishing Time Standards—To establish satisfactory time standards on indirect labor requires specialized knowledge, but it can be done quite economically. The tools used are the familiar work measurement tools of the methods engineer—time study, predetermined motion-time standards, work sampling, time formulas, and standard data.

Maintenance is one outstanding area of indirect labor where these tools can be applied, and where the work is difficult, if not impossible, to control without standards.

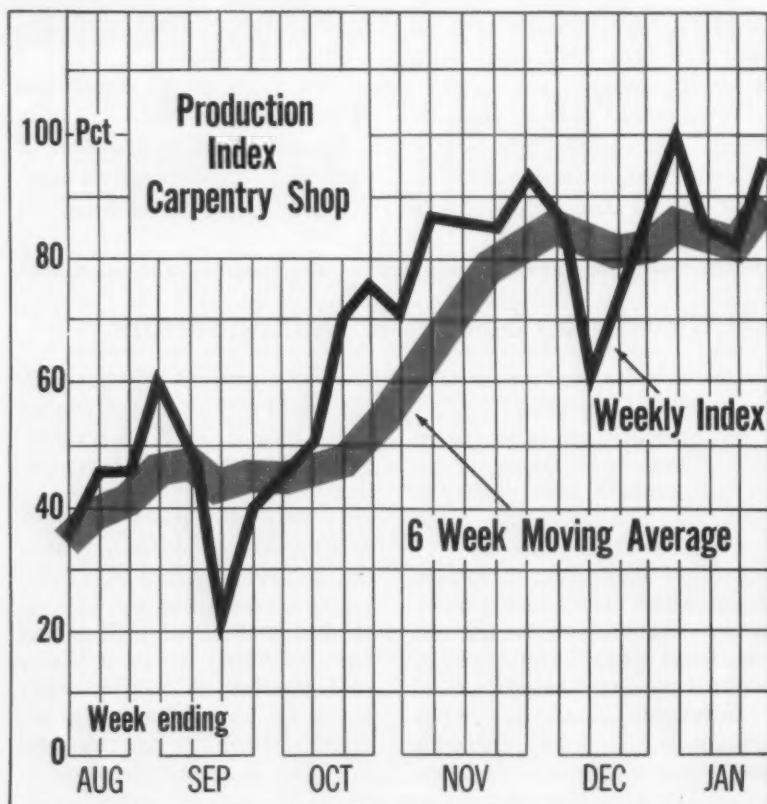
First, it should be recognized that it is not practical to try to determine the exact time required to do each job. Instead, it is more practical to set standards based on a range of time in which a given job will probably be done by a qualified man.

You can say that a qualified man will do a given job in, say, from 40 to 60 min., and be right perhaps 99 times out of 100.

Step-By-Step—To make this simple concept work requires three steps: (1) Development of accurate time data; (2) establishing standard

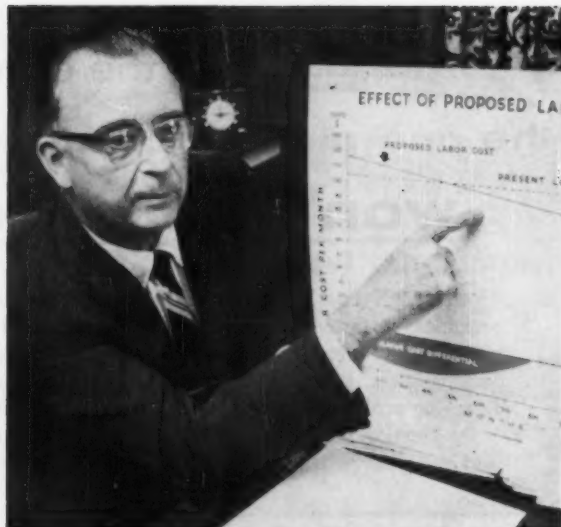
Standards Improve Efficiency

Five Months Record of Typical Carpentry Shop After Application of Time Standards





"When maintenance is properly organized and standards established . . . efficiency rises 90 to 95 pct."



"Saying this another way, when maintenance work is measured and controlled, costs are reduced by 40 to 45 pct."

work groupings; (3) establishing bench mark jobs.

The development of time data, which used to be an endless task when only time study was available, has been greatly simplified by the recent development of predetermined time systems such as Methods-Time-Measurement, or MTM.

It is possible to develop time data with a system like MTM in a fraction of the time required by time study. Further, once a set of time data has been developed for a given craft or operation in any one company, it can easily be modified to the conditions existing in another company or plant.

Work Groupings—The next step is to establish standard work groupings. This means dividing the time required to do all maintenance jobs into time ranges. The range of time covered by each work grouping is long enough to make it easy for a man thoroughly familiar with maintenance work to place any given job in the correct group, and short enough so that when the hours earned are compared with the hours worked over a period, a reasonably accurate measure of performance is obtained.

The final step is to establish rep-

resentative bench mark jobs for which accurate standards are developed from the time formulas. When these are available, the standards applicator—who must be a thoroughly experienced maintenance man himself—has only to compare new maintenance jobs as they come along to the established bench mark jobs to place the new jobs in the proper standard work groupings. The process is quick, and an experienced applicator can establish standards covering the work of from 50 to 60 maintenance workers.

Case History—Once standards are available, they may be used for control purposes. Inevitably, costs begin to come down.

For example, when standards were first applied to a group of maintenance carpenters (see chart), their performance was found to be averaging about 35 pct. Six months after standards were applied, performance reached 90 pct. This means that the time to do a job with a standard of 10 hours was reduced from 28.5 to 11 hours.

The result was obtained by proper organizing, good training methods, setting performance targets, and by steady application of

competent supervisors.

Basically, the results are not obtained because people work harder, but because they work more steadily and more effectively.

Incentive Possibilities—One final word—in this discussion, I assumed that the standards are to be used for performance control measures. The standards may be used either under some form of measured day work or for incentive wage payment. Of the two, I favor the latter.

Wage incentives, properly measured, are fairer to the worker in that he is given the opportunity to earn in proportion to his ability and application. They can result in higher production and lower costs.

But they must be properly administered. There have been many cases where wage incentives have been something less than successful. You must be sure that you have a properly trained organization before embarking on wage incentives.

Reprints of this article are available as long as the supply lasts. You may obtain a copy from Reader Service Dept., The IRON AGE, Chestnut & 56th Sts., Philadelphia 39, Pa.

Continental has the cure for vibration "headaches" the one-piece locking screw that won't work loose

HOLTITE® NYLOK Screws and Bolts are one of the many progressive ideas in fasteners pioneered by Continental. These one-piece, self-locking fasteners with the Nylon insert eliminate the need for lock washers, jam nuts, wiring, and similar devices. If you have fastening problems (like the applications below), for which Nylok is the practical solution, you can start now to save assembly dollars, and give your product a definite competitive advantage.

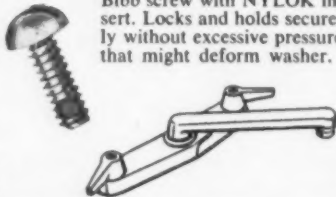
BEAT VIBRATION, KEEP CHAIN SAWS "ON THE JOB"

Several styles of machine screws with NYLOK inserts are used. Stay tight, ending previous customer complaints of high maintenance costs.



HOLD FAUCET WASHERS FIRMLY AT CORRECT ADJUSTMENT

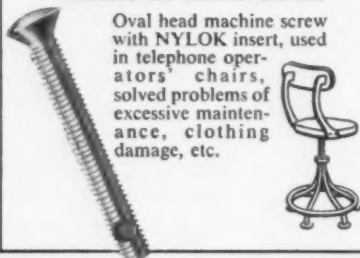
Slotted round head Monel Bibb screw with NYLOK insert. Locks and holds securely without excessive pressure that might deform washer.



HOLTITE® NYLOK® Self-locking Screws

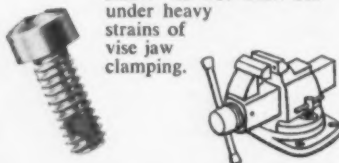
STAY TIGHT UNDER CONSTANT STRESSES IN METAL CHAIRS

Oval head machine screw with NYLOK insert, used in telephone operators' chairs, solved problems of excessive maintenance, clothing damage, etc.



WITHSTAND REPEATED SHOCKS IN VISE JAW INSERTS

Phillips fillister head machine screw with NYLOK insert will not back out under heavy strains of vise jaw clamping.



CHECK YOUR ASSEMBLIES. Find out where Continental cost-saving ideas, like Nylok, can cut your assembly costs. Continental Assembly Specialists are fully qualified to analyze your operations and advise which fasteners — *standard or special* — can save you most. For prompt service, write or phone: Continental Screw Co., 450 Mt. Pleasant St., New Bedford, Mass.

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HY-PRO TOOL COMPANY... DIVISION
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Resilient nylon plug (A) sets up a lateral thrust, smoothly wedges mating threads together (B). All locking action is on threads: head is not stressed. Locking is positive . . . seated or unseated.



One piece — no separate parts
Can be removed and replaced
Interchangeable — reusable
Locks seated or unseated
Acts as seal for gases, liquids

Rambler Plans Major Expansion

\$10 Million Is Earmarked for New Equipment

To keep up with its steadily climbing sales curve, AMC will add to its production lines.

Capacity is expected to be increased one-third by next summer.—By H. R. Neal.

■ Last week American Motors Corp. invited some 300 of its "key" automotive suppliers to dinner. After wining and dining the guests AMC president George Romney served up a large portion of good news for dessert.

AMC will expand its Rambler production capacity from its present maximum of 330,000 units annually by one-third. In boosting its output to 440,000 units the company will spend \$10,150,000 on its first mod-

ern major expansion program.

All for Equipment—Mr. Romney outlined the areas where AMC will spend its money and pointed out none of the expansion funds were earmarked for "brick and mortar." Rather, the money would go into its present Wisconsin facilities.

The company will spend \$5.55 million in its Kenosha assembly and manufacturing plant. Production capacity of the six-cylinder engine line will be increased from 50 to 75 units per hr. This will raise daily outputs of the two-shift operation to 1200 engines from its present maximum of 800 units.

Body Plant Expansion—Additional equipment will be required to expand capacity of the front sus-

pension line and rear axle line to keep pace with the higher production capabilities.

The remaining \$4.6 million will be used to boost output of the Milwaukee body facility from 1000 to 1200 Rambler bodies per day. Among other things, this will entail installation of additional welding equipment for the unitized body construction line, lengthening of the present trim line, and additions to the paint line.

Ready for '60—Plans call for much of the expansion to be completed by spring. The complete program is scheduled for completion by late summer—in time for production of 1960 models.

Mr. Romney is a staunch advo-

High Points in AMC's Rags-to-Riches Story

April, 1950—Nash-Kelvinator Corp. introduces 100-in. wheelbase Rambler.

Jan., 1954—108-in. wheelbase Rambler introduced as companion to its smaller series.

May, 1954—American Motors Corp. formed by merger of Nash-Kelvinator and Hudson Motor Co.

Oct., 1954—George Romney named AMC president.

Nov., 1954—AMC announces plans to market Rambler as its basic volume car.

April, 1955—\$60 million product development program launched.

Aug., 1955—Rambler capacity boosted by 60 pct.

May, 1956—V8 engine introduced,

developed at a cost of \$11 million.

Oct., 1956—1957 Ramblers become a separate line without Nash or Hudson designation.

Oct., 1957—Nash and Hudson lines dropped; replaced by Ambassador, a scaled-up Rambler.

Jan., 1958—Profit of \$4.9 million announced, first quarterly profit in AMC's four-year history.

Jan., 1958—100-in. wheelbase Rambler re-introduced as the American series.

March, 1958—Rambler moves into 7th place in production vs 12th for the first three months of the previous year.

April, 1958—Production boosted twice, by 10 pct then 6 pct.

May-June, 1958—Three more production boosts.

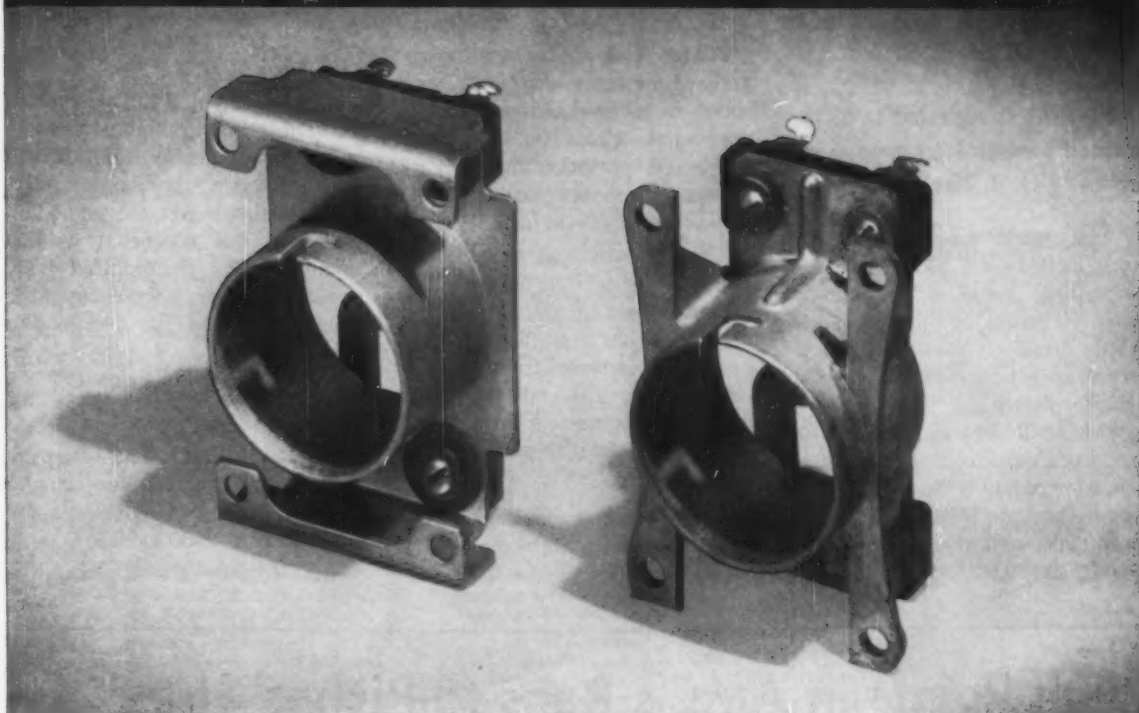
Aug., 1958—Record model year production of 162,182 Ramblers, up 91 pct over 1957.

Sept., 1958—Sales goal for 1959 set at 252,000 units, later raised to 300,000.

Oct., 1958—New models introduced. Rambler moved into 6th place in production for the year.

Nov., 1958—AMC announces \$26 million profit for fiscal year, declares first stock dividend. Production of 1959 models boosted sixth time since September. Romney announces \$10,150,000 expansion program to boost capacity to 440,000 units a year.

FOR *Cutting Costs and
Saving Shop Time*
ZINC DIE CASTINGS ARE BEST



Redesigning this vacuum tube base cut manufacturing costs by 50%.

The old base (shown at left) required seven operations from blanking the steel frame to staking the socket in position.

As a zinc die casting (shown at right), only one operation — punching the tube pin slot — was necessary. By die casting this part from zinc rather than from aluminum, the following *additional* advantages were achieved:

- . . . Less draft on the socket
- . . . Greater overall strength
- . . . Lower die cost

For similar savings review your metal parts that possibly can be produced as ZAMAK alloy die castings.

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Automotive Production

WEEK ENDING	CARS	TRUCKS
Dec. 13, 1958	142,609	22,592
Dec. 6, 1958	147,361	22,596
Dec. 14, 1957	145,503	22,691
Dec. 7, 1957	139,597	22,636
TO DATE 1958	3,940,044	820,456
TO DATE 1957	5,865,846	1,044,156

*Preliminary Source: Ward's Reports

cate of reliance on outside suppliers, where possible, as a means of promoting a healthful economic climate. He assured AMC's suppliers the auto company's expansion program would take place only in those areas of manufacturing where it is currently engaged.

What They'll Buy—It is AMC's intention, the president said, "to take advantage of the ingenuity and facilities of its suppliers." About 55 pct of the parts and components for Ramblers are purchased from some 800 automotive suppliers.

As completion of the expansion program permits greater production, he pointed out, the company will boost purchases of stampings, castings, forgings and other parts and components over and above its present requirements.

Two and Three Shifts—By next fall, body framing, painting, trim and final assembly lines will all be operating on a regular two-shift basis. It's planned that machining, press, foundry and forge operations will operate three shifts.

The need for greatly expanded Rambler capacity has developed in a relatively short space of time. When the 100 in. wheelbase Rambler, now the American, was introduced in April 1950 only 15,577 units were sold in the U. S. that year. By 1953 sales rose to 53,561.

Steady Growth—In Jan. 1954, AMC introduced the 108-in. wheelbase as a companion for its smaller model, but sales for the year fell to 36,042 units. In Nov. 1954, the company announced plans to market Rambler as its "basic volume car" through its Nash and Hudson dealers. That year sales doubled to

73,807, slipped by only 2500 units the following year even though the 100-in. wheelbase Rambler was discontinued.

Then in 1957 sales showed a significant jump to 98,567 units. The 1957 model year was the last in which Rambler received competition from the company's full sized cars, Nash and Hudson. They were dropped when the 1958 models were introduced.

Earns First Profit—Sales in the last quarter of the year, also the first quarter of the company's fiscal and model year, brought the first quarterly profit since American Motors was formed through the merger of Nash-Kelvinator Corp. and Hudson Motor Co. in May, 1954.

The company has maintained profitable operations in every quarter of this year, closing out its fiscal and model years at the end of Sept. with a profit of \$26 million (and declared a 5 pct stock dividend, also a first) on sales of 154,372 units. Including a company estimate of sales for December, AMC expects

to end the calendar year with sales of about 196,000 Rambler, American and Ambassador automobiles.

Raising Sales Goals—Since starting production of 1959 models in September, the company has raised its production schedules six times as it raised its sales goal from 252,000 units (then considered "ambitious" by many industry observers) to about 300,000 units now.

Chrysler May Build Small Car in '60

Chrysler intends to build a small car at its Dodge Main plant in Detroit for 1960, according to a UAW executive.

During negotiations to settle a strike which has closed down a number of other plants, the union leader said, Chrysler warned the union the small car job might go to another of the company's divisions if the Dodge strike continued.

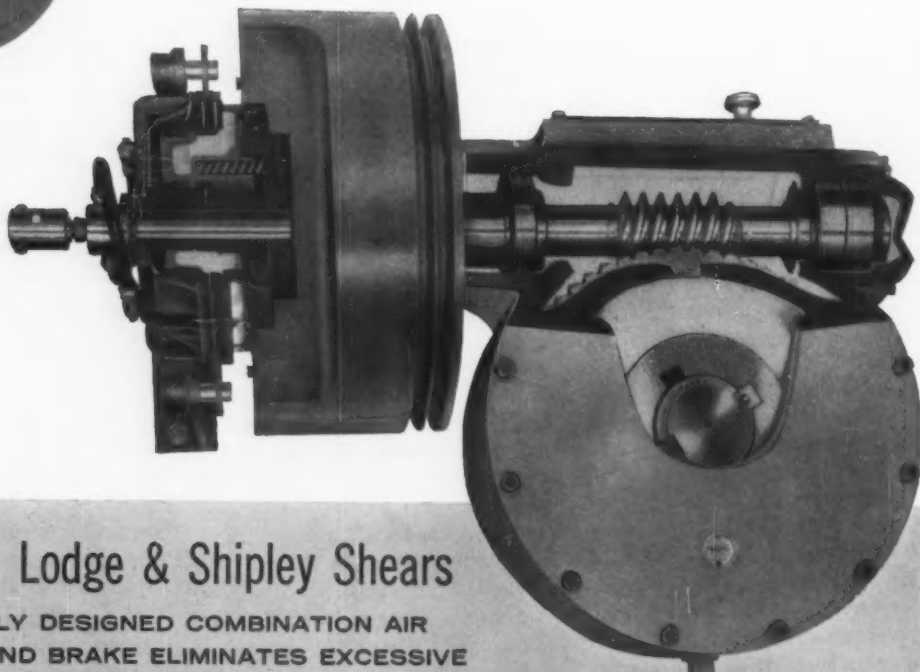
He said the small car program would add 12,000 jobs to the present Dodge employment of 8000.

The Bull of the Woods



EXTRAS

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...SPECIALLY DESIGNED COMBINATION AIR
CLUTCH AND BRAKE ELIMINATES EXCESSIVE
MAINTENANCE COMMON ON HEAVY DUTY PLATE SHEARS

The "standard extras" you find on Lodge & Shipley Shears, although not reflected in the price, are important in time-saving, effortless operation, accuracy and low-cost service.

THE COMBINATION AIR CLUTCH AND BRAKE, for example . . . its single unit design positively eliminates overlap between clutch and brake. Disc-type construction is self-adjusting for fast, smooth starting and safe, positive stopping. The clutch provides automatic overload safety; the brake applies automatically in the event of electrical or air supply failure.

NO OTHER SHEAR, EVEN AT EXTRA COST, can offer the exclusive combination of features found, for instance, on the $\frac{1}{2}$ " Lodge & Shipley Shear:

- 2-stage Hydraulic Holddown System • Remote-operating Foot Control
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Find out how much more you get . . . **WITHOUT EXTRA COST** . . . on a Lodge & Shipley Shear. For details, see Sweet's Machine Tool File or request Bulletin No. PS-15 from: The Lodge & Shipley Co., 3073 Colerain Ave., Cincinnati 25, Ohio.



Capacities to $\frac{1}{2}$ " x 12'

Lodge & Shipley

Your LODGE-ical Choice!

Congress Aims to Raise Wages

Taft-Hartley Law May Bite the Dust in the Process

A top-heavy majority gives Democrats a chance for legislation that would raise wage scales.

Top targets are State right-to-work, Taft-Hartley and minimum wage laws.—By G. H. Baker.

Wages will rise next year. Influential Democrats in Congress are now laying the groundwork for the increases.

For one thing, it appears certain the national minimum wage will rise from the present \$1 per hour to \$1.25. Secondly, congressional leaders are planning to extend federal wage and hour regulations to all establishments not now covered.

Repeal T-H—Repeal of the Taft-Hartley labor law is also planned by the top Democrats in both the Senate and the House. Labor leaders have been clamoring for this for the past 11 years. Now, top-heavy majorities of Democrats in both houses of Congress put repeal in sight.

Democratic members of the Senate Labor Committee say one of the first things they'll attempt is to eliminate all state right-to-work laws. But Section 14B of the Taft-Hartley Law authorizes states to enact right-to-work laws. Knocking out this section, or scrapping the entire Taft-Hartley statute, would cancel all existing 19 state right-to-work laws with one stroke of the pen.

An Economic Club

Government officials are threatening economic punishments on Southern localities involved in the more violent racial controversies.

The availability of "public schools and other public conveniences" will have to be considered as the government determines the location of new or expanded federal facilities, says Attorney General William P. Rogers.

In addition, the Attorney General believes private industry, in making new investments, "will necessarily take into account the climate of local opinion and the public facilities."

Union Spending

Labor unions spent so much to defeat right-to-work proposals last November that they may have bought themselves some close Congressional scrutiny.

Union outlays in the six states where the laws were an issue came to more than \$10 million, the U. S. Chamber of Commerce figures. The Chamber estimates the expenditures by backers of the law at about \$2 million.

Box Score—The unions were successful in blocking the proposals in five states—California, Ohio, Washington, Idaho, and Colorado. Only in Kansas was the vote against compulsory unionism.

Unions spent almost \$5 million in California, and between \$3 million and \$4 million in Ohio, according to the Chamber. Other union outlays: \$1.4 million in Washington, \$650,000 in Colorado, \$300,000 in Idaho.

Trade Battle Is Warming Up

Counter Offensive—The U. S. may swing back at the Soviet world trade offensive with tax relief for American businessmen on their foreign investments.

Top Washington officials are frankly worried over the spreading of Red influence in so-called uncommitted areas of the world through trade. The Russians sell machinery and raw materials at loss prices. This makes them look like benefactors in the eyes of these backward nations, and cuts everyone else out of the replacement, maintenance, and spare parts business.

Seek Relief—Tax relief is necessary for American firms to maintain their world markets, Rowland C.

W. Brown, Machinery and Allied Products Institute, recently told a congressional committee.

He said that more American manufacturers are ready to set up manufacturing plants abroad because their foreign customers don't have the dollars to buy products from the U. S. But present tax laws block many such projects.

A Plan—One suggestion is that the government reduce or eliminate taxes on income earned abroad by U. S. firms, or at least defer the tax until profits are returned to this country. This, its sponsors say, would encourage reinvestment of profits abroad, promote economic progress, and help blunt the Red economic offensive.



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Note how the lock wire, uncoiling from the inside, is dispensed as needed from a hole in the top of this compact 1-pound package. No wild uncoiling! Moreover, the wire is better protected, handles easier and faster, with less waste, and with greater safety!

Here is a new National-Standard packaging development that is a natural for most safety lock wire uses in equipment manufacture, assembly and servicing.

For production operation requiring larger capacities, National-Standard offers lock wire on practical 5 and 10-pound disposable spools that may be spindle-mounted.

Check with National-Standard on the spooling of your choice and on stainless steel lock wire in any diameter from 0.020 to 0.067 and to government specifications: QQ-W-423, AN-W-24, MIL-W-6713 or AMS-5685-C.

NATIONAL



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DIVISIONS: NATIONAL-STANDARD, Niles, Mich.; tire wire, stainless, music spring and plated wires

WORCESTER WIRE WORKS, Worcester, Mass.; music spring, stainless and plated wires, high and low carbon specialties • REYNOLDS WIRE, Dixon, Ill.; industrial wire cloth

WAGNER LITHO MACHINERY, Secaucus, N. J.; metal decorating equipment • ATHENIA STEEL, Clifton, N. J.; flat, high carbon spring steels

Why Imports Increase in Farwest

Favorable Steel Market Attracts Foreign Mills

Steel products made overseas, mainly in Western Europe and Japan, are coming into the West Coast in larger waves.

During first half of '58 they increased 20 pct over same period in '57.—By R. R. Kay.

■ The West Coast is taking it on the chin from steel imports.

Foreign-made product is making sharp inroads into the Farwest steel market. And U. S. mills there don't like it.

Japan, for one, intends to push for all the steel business it can get in that part of the country as well as in the rest of the U. S.

Twenty Pct Jump—Over 132,000 tons of foreign steel came to the West Coast in the first six

months of this year. That's a 20 pct jump over the same 1957 period.

These 132,000 tons are 21 pct of all U. S. steel imports. Yet the western market is only 7 pct of the national market. Foreign steel adds up to 5 pct of all Farwest steel consumed versus 1½ pct for the nation.

Heavy Offenders — Over the years more and more steel imports arrive at West Coast ports. In 1956, the region took 13 pct of all steel products coming into the country; in 1957, 17 pct; and for the first six months of 1958, 21 pct.

Let's take a look at the imbalance in some of the products brought in. Some 40,000 of the 70,000 tons of foreign tubular products came to the Coast. And over 25 pct of imported wire and wire products and 20 pct of wire rods came into

the coast market.

The wire and wire products group accounts for the greatest volume of imports—some 51,900 tons. That's 40 pct of all West Coast steel imports for the first six months of this year.

Points of Origin—Where does it all come from? Western Europe ships in most of the wire products, except nails. They come from Japan. About 80 pct of the tubular products come from Europe. Australia sends the rest.

Why does such a big percentage of foreign steel come to the West Coast? The answer is simple. Steel products are priced higher there. So foreign companies buy in the East where material costs less and sell in the West where they can undersell domestic competition.

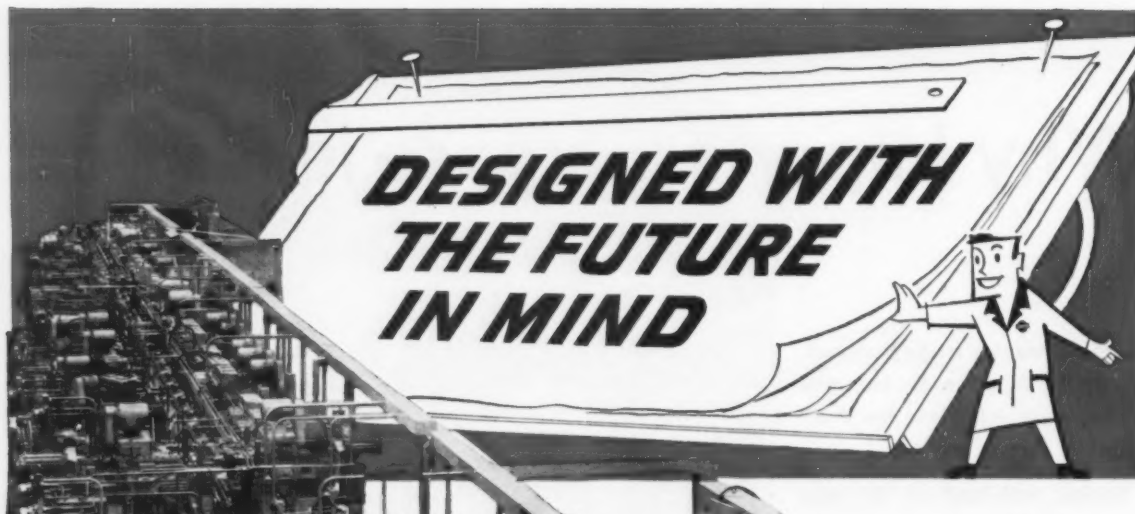
Imports Widen Share of Farwest Market

Each year foreign-made steel products add to their share of the West Coast market. During the first six months of this year imports of the prod-

ucts below increased in the Farwest. In some cases the gains were substantial, from 10 and 20 pct. Here's what happened:

	Estimated Market	Imports (Jan.-June 58)	Import Share	
			First Half, 1957	First Half, 1958
Wire Rods	47,500	11,649	2.9 pct	24.5 pct
Hot-rolled Bars	197,000	4,923	2.0 pct	2.5 pct
Reinforcing Bars	266,000	14,215	1.2 pct	5.3 pct
Structural Shapes	109,200	8,285	5.8 pct	7.6 pct
Buttweld Pipe	127,000	34,900	16.7 pct	27.5 pct
Drawn Wire	78,200	23,707	19.5 pct	30.3 pct
Nails and Staples	44,000	21,279	42.8 pct	48.4 pct
Wire Rope and Strand	13,000	1,270	8.7 pct	9.8 pct

Source: AIS Import Study



Greenlee Transfer Machines can be Reworked to meet Product Changes

The Greenlee "Rearrangeable Unit" concept of transfer machine design is becoming increasingly popular in mass production manufacturing. These machines accommodate recurring changes in product design. Year after year they guard against costly obsolescence . . . they are changed to meet your changing requirements. Get the complete story from Greenlee.

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Cure for Cutting Tool Chatter

Molybdenum Supports Offer High Strength, Stiffness

Field tests show that use of molybdenum tool supports permit high feed rates.

Initial high cost is offset by reduction in overall costs.—By E. J. Egan, Jr.

■ Molybdenum boring bars, grinding quills, and milling cutter arbors are being recommended to cure tool chatter at high feed rates.

The suggestion comes from the Refractomet Div., Universal Cyclops Steel Corp.

Stiffness Advantage—Wrought molybdenum's outstanding feature is its combination of high strength and stiffness, says development engineer William L. Bruckart. It is 50 pct stiffer than steel for a given diameter of bar stock, he notes, and 25 pct stiffer than steel on an equal-weight basis.

Except for tungsten carbide, he says, none of the other materials commonly used for tool supports can match molybdenum's stiffness. He admits tungsten carbide has the edge here. But he notes two objections: Brittleness and limited size.

Field Tested—Bruckart has followed several field experiments in precision boring, grinding, and milling where molybdenum bar stock was used to support cutters and grinding wheels. Reports show the material did permit stepping-up feeds without objectionable chatter.

A molybdenum boring bar or grinding quill of a given diameter also permits deeper hole penetration without adverse effects on surface finish, Bruckart says.

Ninety Pct Shallower—He tells of a milling job on bucket blades

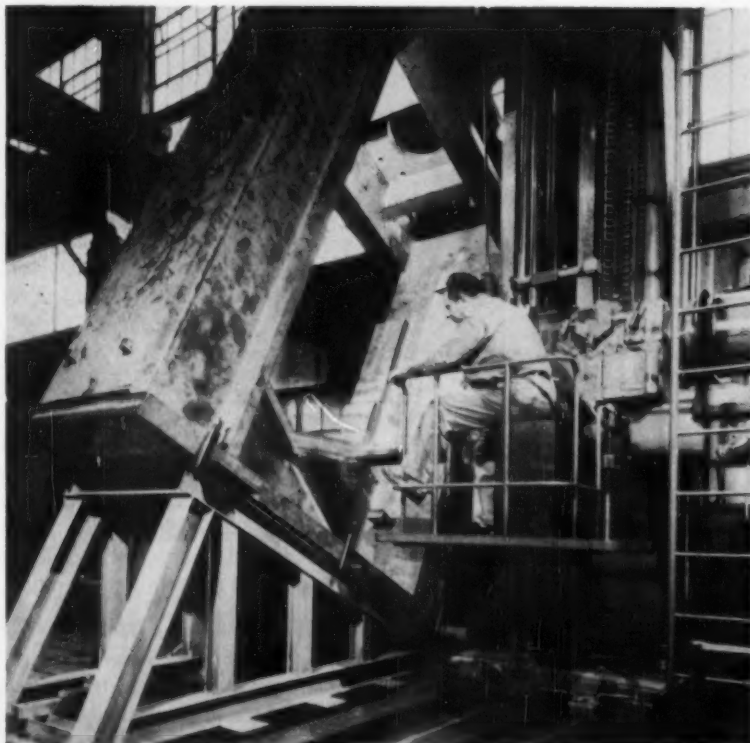
where a molybdenum arbor supported the cutter. Tool marks in the finished bucket were only 10 pct as deep as when the same cutter was supported by a steel arbor. This improvement might possibly eliminate finish grinding, he notes. At the very least, it would bring grinding costs well below former levels.

Round molybdenum bars are available in diameter sizes ranging from 1/16 in. to 7 in. They're not inexpensive. A 1/2-in. round, for example, costs about \$14.30 per ft of

length. A 1-in. round costs about \$59.10 per ft. Foot long bars of steel in the same round sizes cost about 38¢ and \$1.44 respectively.

Saves Overall Cost—Bruckart doesn't think that molybdenum bar cost is prohibitive, however. The material makes it possible to do jobs which were impossible before, he says. Even on jobs now being done, chatter often runs the cost way up. Rigid molybdenum may actually be cheaper in the long run.

Heavy Job to Hold Level



TO MILL "V" ANGLES: Engineers at Baker-Perkins, Inc. tipped this 27-ton shear frame within reach of Giddings & Lewis boring mill.

INDUSTRIAL BRIEFS

Bettinger Buy—The Bettinger Corp., Milford, Mass., has purchased a prefabricated service station business developed by Avco Mfg. Corp. More than \$500,000 was invested in development, engineering, testing and pilot production of the unit prior to Bettinger's acquisition.

Jersey Bound—Rheem Mfg. Co. plans to transfer steel shipping container production from Sparrows Pt., Md., to its container plant at Linden, N. J. The Maryland plant will continue to manufacture Rheem home products items, including automatic storage water heaters.

Parental Prerogative—All assets and properties of Tantalum Defense Corp., subsidiary of Fansteel Metallurgical Corp., Chicago, have been transferred to the parent company. This consolidation transfers to Fansteel ownership and operation of the tantalum-columbium producing plant at Muskogee, Okla.

Brush Up—The Brush Beryllium Corp., Cleveland, is expanding rolling mill facilities at its Elmore, O., plant. A building will be erected to house cold strip mill facilities, additional machinery capacity for billet and slab milling, and an expansion of annealing facilities. The expansion program will cost in excess of \$250,000.

Visual Education—A Navy contract to produce an electronic flight simulator for the Grumman-built Navy S2F-3 anti-submarine warfare airplane has been awarded to the Nuclear Products—Erco Division of ACF Industries, Inc.

No More Comco—Enthone, Inc., New Haven, Conn., will take over and continue in its own name the business of its equipment subsidiary, Comco, Inc., effective Jan. 1. This change will facilitate expansion of the company's equipment business, previously confined to the northeastern U. S., to the entire country.

Tools Translation—A Polish edition of the American Society of Tool Engineers' Die Design Handbook will soon be published. The first printing will be 4,000 copies. Another volume, The Tool Engineers Handbook, is being considered for possible translation into French, Spanish, and Italian.

Milestone—L. Goldstein's Sons, Inc., Philadelphia, metallurgical processors of nonferrous metals, has completed refining its first half million tons of lead and silver base alloys.



PRESIDENT POLK: Louis F. Polk, vice president and group executive, Bendix Aviation Corp. and president, Sheffield Corp., Dayton, O., has been elected president of the American Ordnance Assn., Washington, D. C.

Caustic Note—Dow Chemical Co. will establish terminal facilities for 50 pct caustic soda at the Associated Sales & Supply Co. in St. Louis. By January 1959, facilities are expected to be in full operation.

Hustler Becomes Heifred—The Heifred Co. has purchased the Hustler Corp., electric lift truck producers, located in Willoughby, O. New name of the company will be The Heifred Corp. It is planned to gradually expand the activity of the

company in the continued development of lift trucks and similar equipment for materials handling.

Millions for Mortar Boards—Sixty-three privately endowed educational institutions have received a total of \$1.7 million under Bethlehem Steel Co.'s program of financial assistance to privately endowed colleges and universities. Program was initiated in April 1953. This sum is in addition to other amounts paid by the company to colleges for research conducted at its specific request, or of direct benefit to the steel industry.

Snyder Stands Alone—Snyder Tool & Engineering Co., Detroit, is now known as Snyder Corp. The 33-year-old company manufactures special machine tools and automated machinery. The name was changed to avoid misconcepts about the type of equipment manufactured.

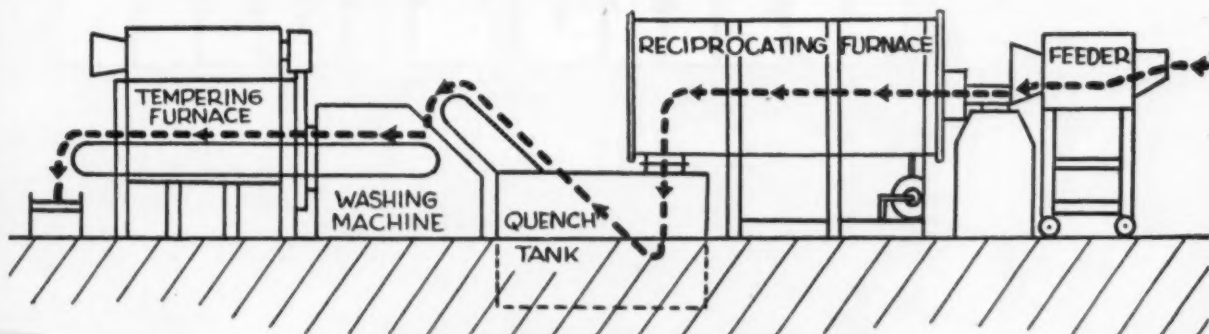
AMA Academy—The American Management Assn. will launch a course in materials management at the AMA Academy, Saranac Lake, N. Y. The one-week program for manufacturing and other executives concerned with the procurement and control of production materials will open February 2.

Goose and Others—The Fairchild Engine & Airplane Corp.'s Guided Missiles Div., Wyandanch, L. I., New York, has been renamed the Astrionics Div., and is now engaged in guidance and controls systems for the Air Force "Goose" missile and an Army drone. The division is working on airborne detection systems known as "Padar" and "Pecor," and producing radar and bombing training devices for the Navy.

Six-Bay Service—Jones & Laughlin Stainless and Strip Div. will complete servicing facilities at its plant in Detroit this month. Facilities include: Six-bay extension in the stainless processing building, and a five-ton overhead electric crane, to extend accommodations for stainless steel billet and bar inventories.

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provide a completely controlled processing atmosphere, thus assuring highest quality work. The "shaker hearth" eliminates the use of mesh belts and conveyors operating at high temperatures. Reduction in maintenance and "down time" provides low operating costs.

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Plants at Lima and Springfield, Ohio

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MEN IN METALWORKING



T. J. Kavanagh, elected president, Wheatland Tube Co., Philadelphia.

P. L. Byron, named president and general manager, Byron Steel Processing, Inc., Blue Island, Ill.; **G. E. Decker**, vice president; **C. H. Gibbons**, sales manager; **A. H. Schultz**, office and traffic manager; **J. S. Skalski**, superintendent.

Col. John Slezak, elected to the board of directors, Clayton Mark & Co., Evanston, Ill.

J. W. Craft, named director of organization, Chrysler Corp., Detroit.

L. H. Nordenson, appointed vice president, foreign operations, Dresser Industries, Inc.

A. E. Murphy, appointed administrator, sales training, Crucible Steel Co. of America, Pittsburgh.



S. P. Whiteside, appointed north-eastern regional sales manager, Kaiser Aluminum & Chemical Sales, Inc., New York headquarters.

Wilbert Fall, appointed assistant vice president, railroad passenger car engineering, Pullman-Standard Car Mfg. Co., Chicago.

W. H. Saxon, named controller, asst. secretary and asst. treasurer, Alabama Metallurgical Corp., Selma, Ala.

D. B. Hughes, appointed sales manager, The Pittsburgh Bridge & Iron Works, Pittsburgh; **E. T. Baughman**, appointed assistant to vice president, and **R. L. Haenel**, appointed chief engineer.

G. A. Dornin, Jr., appointed manager, ingot mold sales, Blast Furnace and Ingot Mold Div., Sharpville, Pa., Shenango Furnace Co., Pittsburgh.

W. H. White, appointed district sales manager, Fulton Sylphon Div., Robertshaw-Fulton Controls Co.

G. W. Metz, named manager, construction, Lehigh Construction Co., subsidiary of Lehigh Structural Steel Co., Allentown, Pa.; **D. J. Lonergan**, named assistant manager, construction.

F. A. Martin, appointed general sales manager, Parts Div., Sylvania Electric Products Inc., Warren, Pa.



R. E. Belknap, appointed eastern division manager, trade relations, New York office, Kaiser Aluminum & Chemical Sales, Inc.



E. M. Zuckert, elected chairman of the board, Nuclear Science & Engineering Corp., Pittsburgh.

M. W. Kostich, appointed West Coast branch manager, Huck Manufacturing Co., Detroit.

Boone Gross, elected a director, National Research Corp., Cambridge, Mass.

J. P. W. Davidson, promoted to director, business development, Saco-Lowell Shops, Boston, Mass.

Following appointments are in the General Sales Office of Chrysler Corp. They are: **R. L. Biggers**, director, government and military



R. S. Strickland, promoted to vice president-general manager, Bearing Divisions, Federal - Mogul - Bower Bearings, Inc.

automotive product sales; **N. W. Seidel**, director, fleet sales; **L. W. Piot**, manager, MoPar dealer sales; **M. L. Van Dagens**, director, sales training.

Brice James, appointed sales promotion assistant, Helipot Div., Beckman Instruments, Inc.

E. N. Foss, II, named director, new products development program, Hersey Manufacturing Co., Dedham, Mass.

C. R. Schall, named foreign sales representative in Maracaibo, Venezuela, Reynolds Metals Co., Richmond, Va.

T. B. Wilk, appointed district manager, northern Ohio and western Pennsylvania, The A. F. Holden Co., Detroit.

R. L. Gutenkunst and **T. J. Gutenkunst**, appointed to the Sales Dept., Milwaukee Malleable & Grey Iron Works, Milwaukee.

Sidney Kelly, Jr., named a member, Law Dept., Wheeling Steel Corp., Wheeling, W. Va.

J. J. Ahern, appointed director of security, General Motors Corp., Detroit.



J. T. Sabol, appointed district manager, Cleveland district office, Inductotherm Corp.

J. F. Kelly, named area sales manager, central and western Massachusetts, Vermont and New Hampshire, Madison-Relco Tool Co. of Providence, R. I.

R. H. Meyer, appointed marketing assistant, Hancock Industries, Inc., Jackson, Mich.

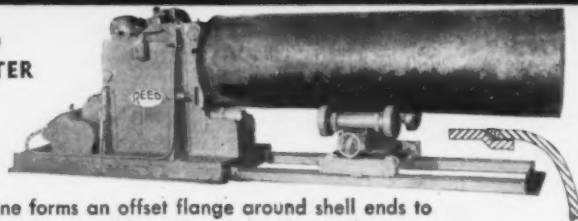


R. E. Klare, promoted to vice president, operations, Bearing Divisions, Federal-Mogul-Bower Bearings, Inc.

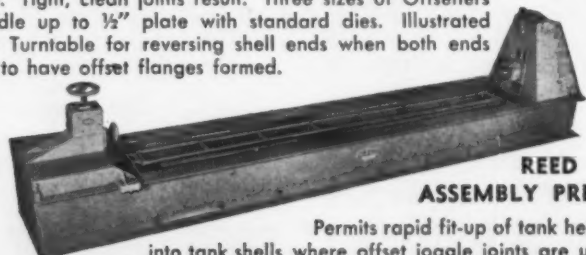
A. L. Snyder, named district manager, Ohio-area sales district, Cincinnati headquarters, The

WEBB TANK PRODUCTION MACHINERY

REED OFFSETTER



This machine forms an offset flange around shell ends to facilitate automatic welding of tank heads. It eliminates chill rings, decreases fit-up time, improves the concentricity of shell ends, and aids in reducing actual welding time. Tight, clean joints result. Three sizes of Offsetters handle up to 1/2" plate with standard dies. Illustrated with Turntable for reversing shell ends when both ends are to have offset flanges formed.



REED ASSEMBLY PRESS

Permits rapid fit-up of tank heads into tank shells where offset joggle joints are used. Hydraulic pressure is applied through ball-and-socket swivel joints that allow the head cups to set to the head. Hydraulically powered kick-outs speed up loading and unloading. Both headstock and tailstock are adjustable vertically; tailstock is also adjustable along the bed for various lengths of vessels up to 18'.

Fit-up rolls are also available to facilitate proper alignment and assembly of shells lacking rigidity.



Horn Type
Fixtures



Cylinder Flange
Offsetters



Assembly
Fixtures



Unit Type
Turning Rolls



Portable
Turning Rolls



Automatic Welding
Track Supports

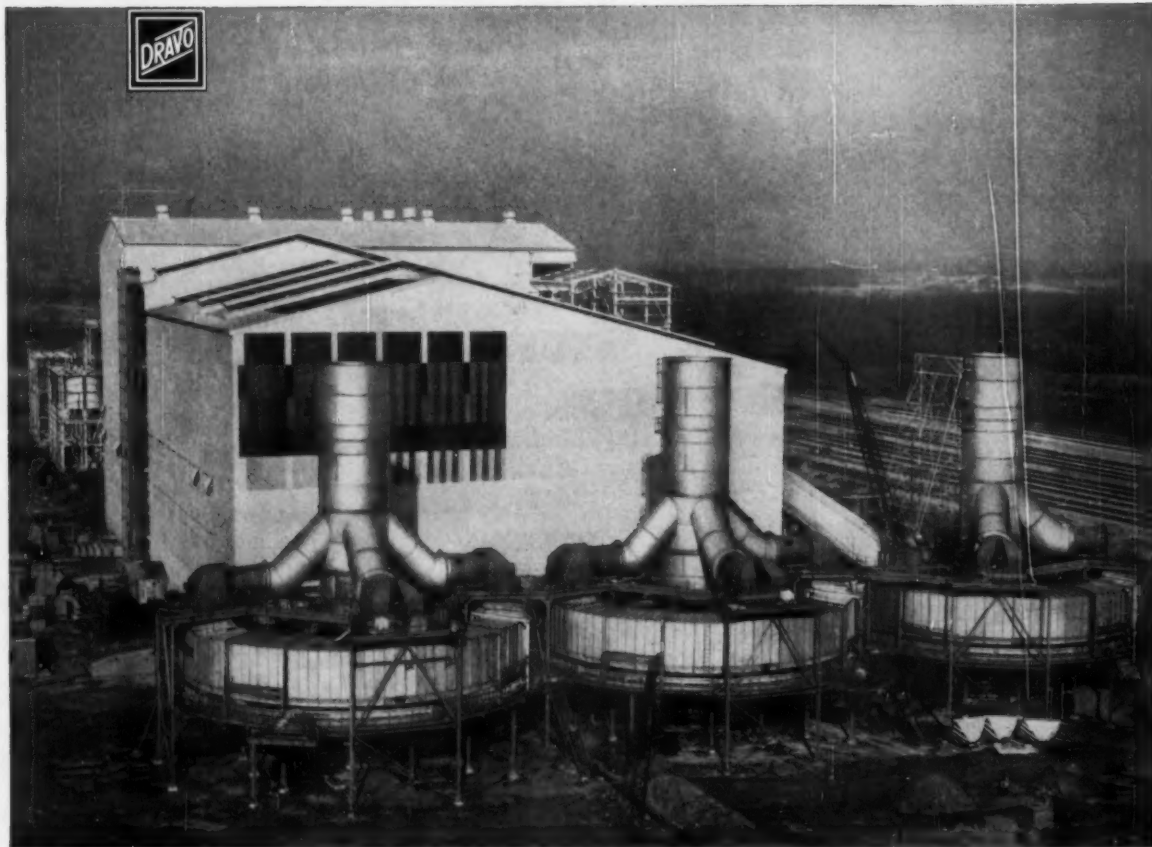
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EQUIPMENT DIVISION

THE **WEBB** CORP.

WEBB CITY, MO.
U. S. A.



At Saxonburg, Pa., Dravo is constructing a sintering plant for U.S. Steel Corporation that will produce 15,000 tons of iron ore sinter per day.

Dravo builds country's largest sintering plants for U. S. Steel

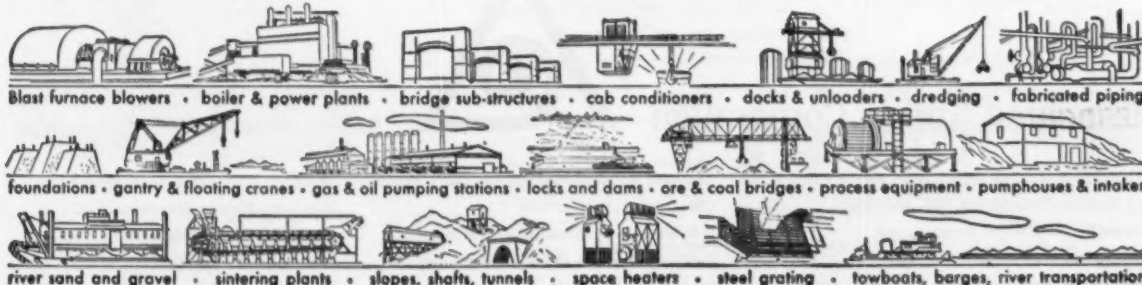
To increase efficiency of blast furnace operations by better utilization of iron ore fines, United States Steel Corporation is building two giant sintering plants—one at Gary Steel Works, Gary, Indiana; the other at Saxonburg, Pa., north of Pittsburgh, to be operated by Edgar Thomson Works.

As exclusive U.S. licensee of the Lurgi Company (Europe's foremost producer of such equipment) Dravo is handling design—and fabrication and erection of mechanical equip-

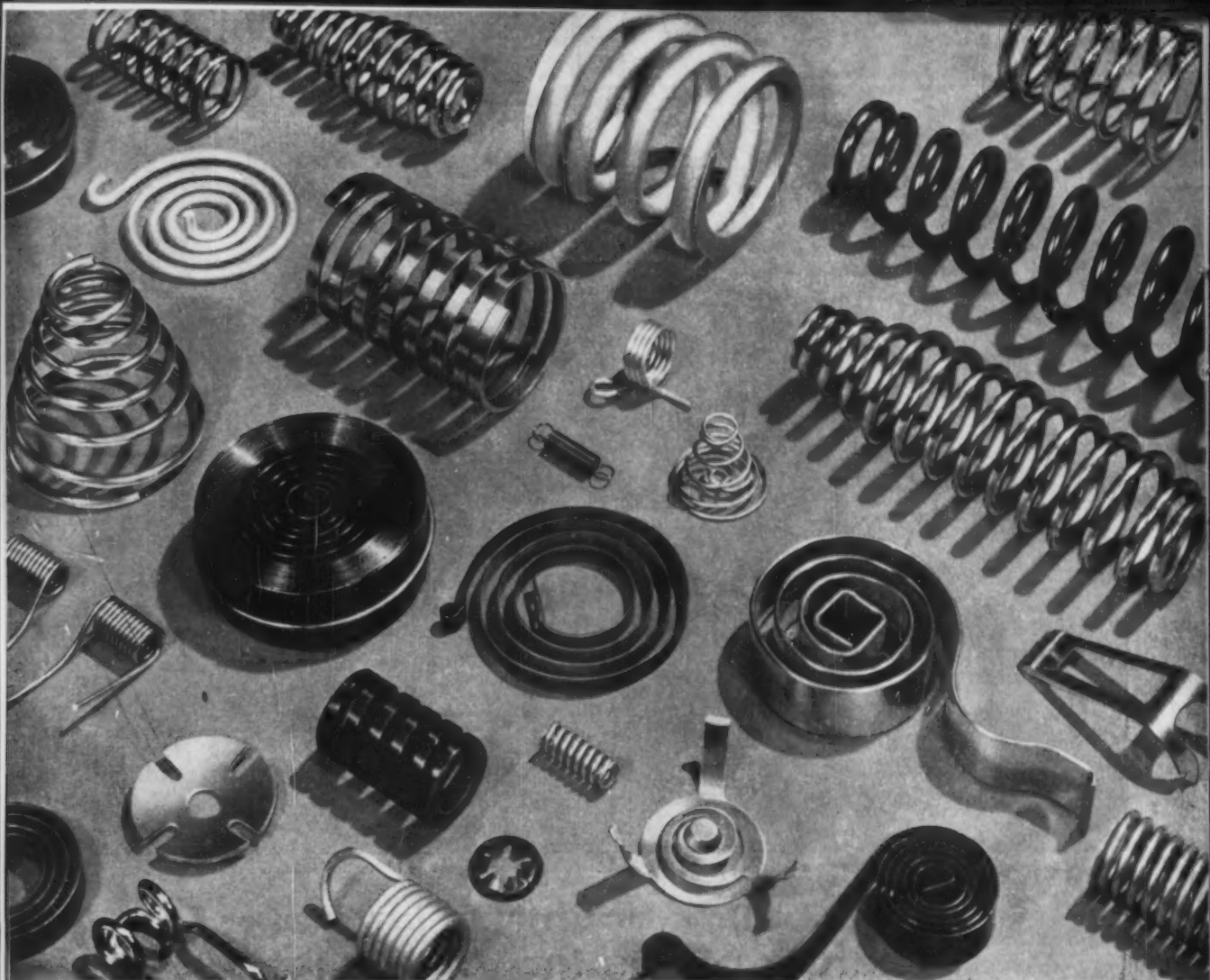
ment—for both installations. Each includes three sintering machines and three coolers. American Bridge Division of U.S. Steel is handling fabrication and erection of the buildings.

The U.S. Steel and other sintering projects currently under contract at Dravo underscore the growing importance of this process to the steel industry. For information on products and services listed below, write **DRAVO CORPORATION, PITTSBURGH 25, PA.**

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CORPORATION



blast furnace blowers • boiler & power plants • bridge sub-structures • cab conditioners • docks & unloaders • dredging • fabricated piping
foundations • gantry & floating cranes • gas & oil pumping stations • locks and dams • ore & coal bridges • process equipment • pumphouses & intakes
river sand and gravel • sintering plants • slopes, shafts, tunnels • space heaters • steel grating • towboats, barges, river transportation



Which of these did you use today?

Alarm wake you this morning? Stove timer work all right? Did you drive to work . . . take a business trip by air . . . press a light switch . . . use a dictating machine . . . or home workshop motor? Then you, or someone in your home or business, used a spring. With a product-mix like this it's practically certain that we enter your daily living, tucked anonymously away in nationally known and respected brands of all sorts of articles.

Write for a copy of "How to Solve Your Spring Design Problems" to learn how early consultation with the spring manufacturer results in improved design and performance.

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General Offices: Bristol, Connecticut

Wallace Barnes Division, Bristol, Conn. and Syracuse, N. Y.

B-G-R Division, Plymouth and Ann Arbor, Mich.

Seaboard Pacific Division, Gardena, Calif.

Cleveland Sales Office, Cleveland, Ohio

Canadian Subsidiary: The Wallace Barnes Co., Ltd., Hamilton, Ontario and Montreal, Quebec

Raymond Manufacturing Division, Corry, Penna.

Ohio Division, Dayton, Ohio

F. N. Manross and Sons Division, Bristol, Conn.

San Francisco Sales Office, Saratoga, Calif.

William D. Gibson Division, Chicago 14, Ill.

Milwaukee Division, Milwaukee, Wis.

Dunbar Brothers Division, Bristol, Conn.

Wallace Barnes Steel Division, Bristol, Conn.

Arnold Engineering Co. of Marengo, Ill.; **James Borst**, will be in charge of the Cleveland sales engineering office.

C. W. Bishop, appointed manager, Southwestern regional sales office in Dallas, Consolidated Electrodynamics Corp., Pasadena, Calif.



R. W. Muzzy, promoted to general manager, Federal-Mogul Div., Federal - Mogul - Bower Bearings, Inc.

J. L. Taggart, named director, marketing, American Bosh Arma Corp., Hempstead, N. Y.

Earl Schwenk, Jr., promoted to manager, Sheet and Strip Dept., Production Steel Co. of Illinois.

G. R. Cox, named advertising manager, Judson L. Thomson Mfg. Co., Waltham, Mass.



Dr. G. E. Claussen, appointed director, research and welding engineering, Arcrods Corp., Sparrows Point, Md.

F. C. Anderson, appointed to the engineering staff, NICAD Div., Gould-National Batteries, Inc., Easthampton, Mass.

Mark Baraz, appointed sales representative, north side of Chicago and northern Illinois, Caine Steel Co., Chicago.

Sidney Grey, appointed service manager, Instruments Div., Philips Electronics, Inc., Mount Vernon, N. Y.

George Costello, joins Servo Corp. of America, New Hyde Park, L. I., N. Y., as sales engineer, Government Contracts Dept.

L. W. Lubenow, appointed field sales manager, Semi-Bulk Materials Handling Div., Powell Pressed Steel Co., Youngstown, O.

Phil Bain, promoted to product line manager, industrial and commercial controls sales, Controls Co. of America, Schiller Park, Ill.; **H.**

R. Chapin, named chief product engineer, appliance and automotive controls; **J. J. Kaleba**, appointed engineering supervisor, Switch Group; **Marshall Zugehar**, promoted sales coordinator, International Division activities.



L. B. Arata, appointed sales engineer, Precision Metalsmiths, Inc.

W. T. Ellison, named sales representative, Western Illinois. Fed-



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J. R. Connell, appointed acting purchasing agent, The Babcock & Wilcox Co.'s Boiler Div., Barberton, O.



C. D. Bacon, promoted to Western regional sales manager, Los Angeles office, Brush Instruments, Div. of Clevite Corp., Cleveland.

R. R. Burns, appointed director, purchases and **W. M. Boardman**, purchasing agent, Oakite Products, Inc., New York.

F. H. Hohn, named chief metallurgist, Scullin Steel Co., Div. of Universal Marion Corp., St. Louis.

OBITUARIES

V. H. Lawrence, 61, former vice president, industrial relations, Jones & Laughlin Steel Corp.

I. J. Behr, 56, president, Joseph Behr & Sons, Inc., Rockford, Ill.

T. R. Mullen, president, Lehigh Structural Steel Co., Allentown, Pa.

D. L. Miller, 55, personnel director, Lehigh Structural Steel Co., Allentown, Pa.



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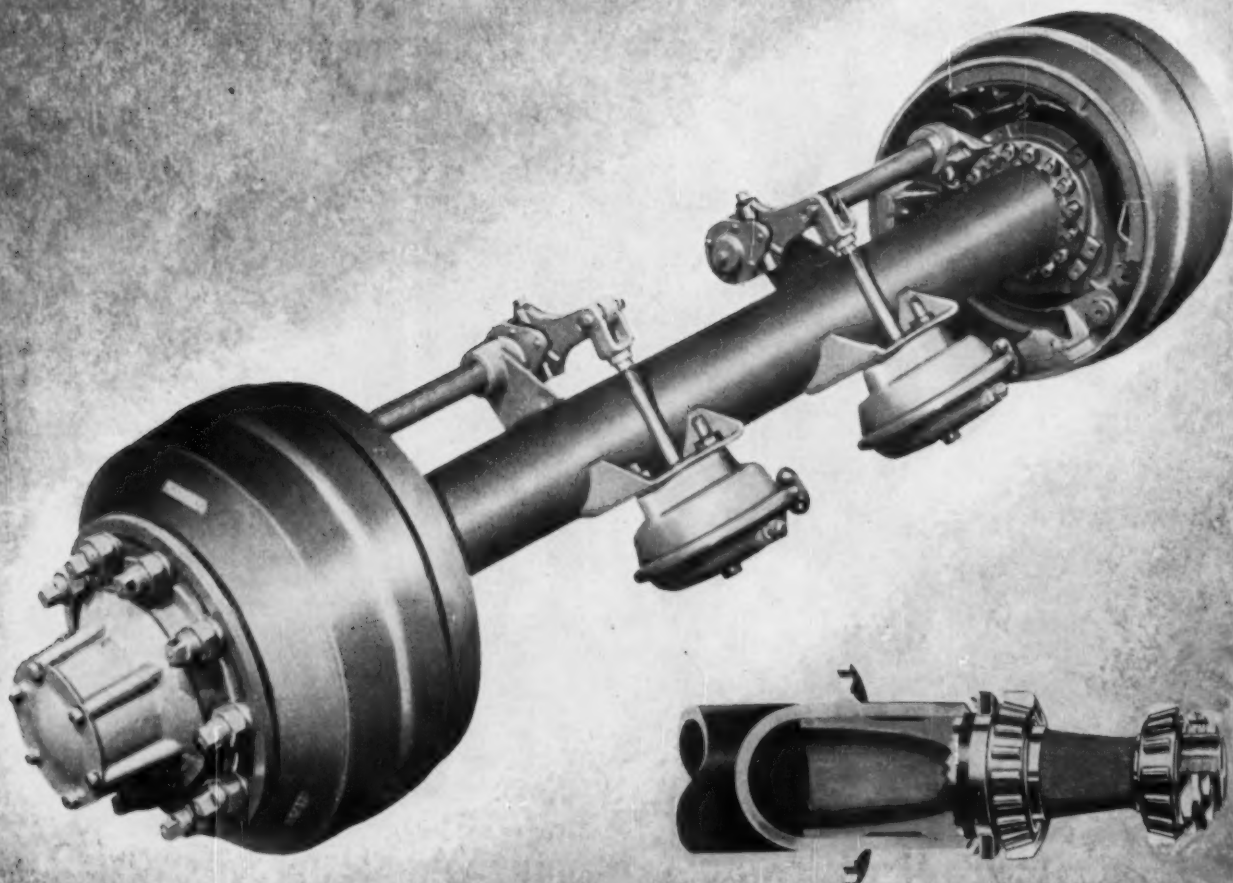


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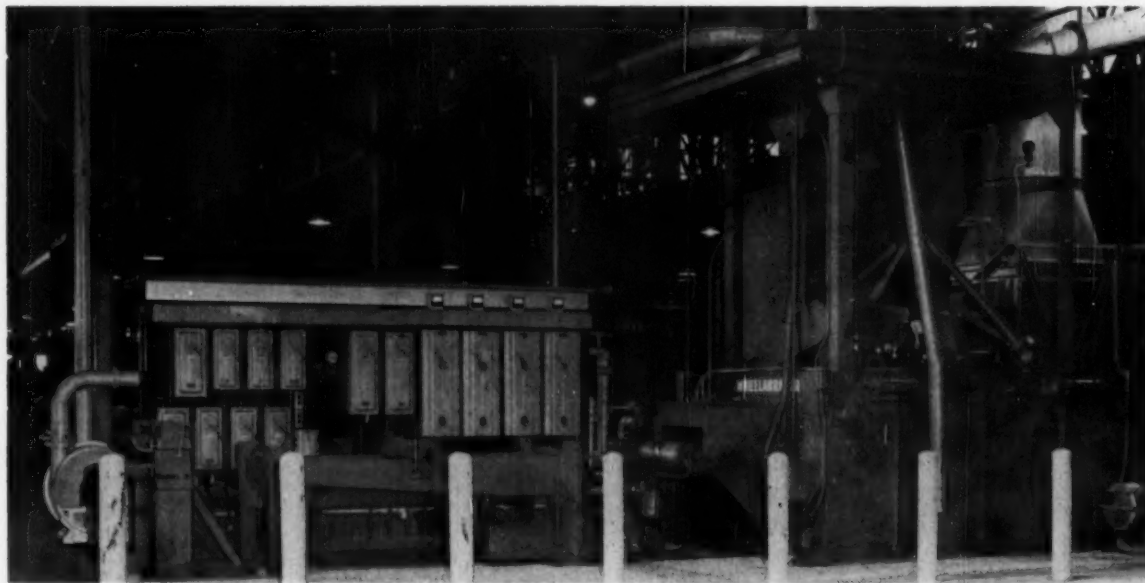
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COOLS AND CLEANS: Water bath cools rod strands before they enter Wheelabrator machine at right.

Shot-Blasting Proves Practical In High-Speed Rod Line

Acid cleaning was the old standby in wire mills.

But as the need grew for faster, more efficient output, so did the problem of waste-acid disposal.

Mechanical descaling proved to be the answer.

For more than a decade, the wire industry has been faced with a strong buyer's market and strong competition from both domestic and foreign sources. Added to this, American mills have been plagued with a steady series of wage increases. To stay in business, the mills have had to engage in a vigorous modernization program to improve their efficiency.

About four years ago, John A.

Roebling's Sons Corp. installed a line for continuous patenting, cleaning, and coating of steel wire. Recently, the same principle was applied to steel rods as well. Patenting and cleaning used to be done in two separate operations. Now both steps are handled in a single continuous line.

One of the more unusual features of the new line is the use of mechanical descaling on rod. It resolves a growing problem associated with acid cleaning—that of waste-acid disposal.

Uses Shot-Blasting—Heart of Roebling's new descaling setup is a shot-blasting machine made by the Wheelabrator Corp., Mishawaka, Ind. Two sets of sheaves, one outside and one inside on each end of

the unit, guide the rods through the machine and keep them equally spaced on 1½-in. centers.

Just inside both ends of the unit is a pneumatically operated pressure bar to keep tension on the rods as they pass through the cleaning zone. This prevents the rods from rotating as they go between the wheels. In some instances the guides aren't needed to obtain proper cleaning.

A set of pneumatically controlled guide sheaves are located just outside the unit on each end to guide the rods externally. The outside sheave guide drops down, and the inside bar rises to release rod tension and permit stringing of strands through the line.

Assures Coverage—Four 30-hp

motor-driven wheels propel the shot toward the rods. They're located two above and two below the rod path, at right angles to the line of travel.

The two lower wheels are near the outside wall of the chamber. They rotate opposite each other, projecting the shot in a triangular pattern up and toward the opposite wall. The two upper wheels are just off the center

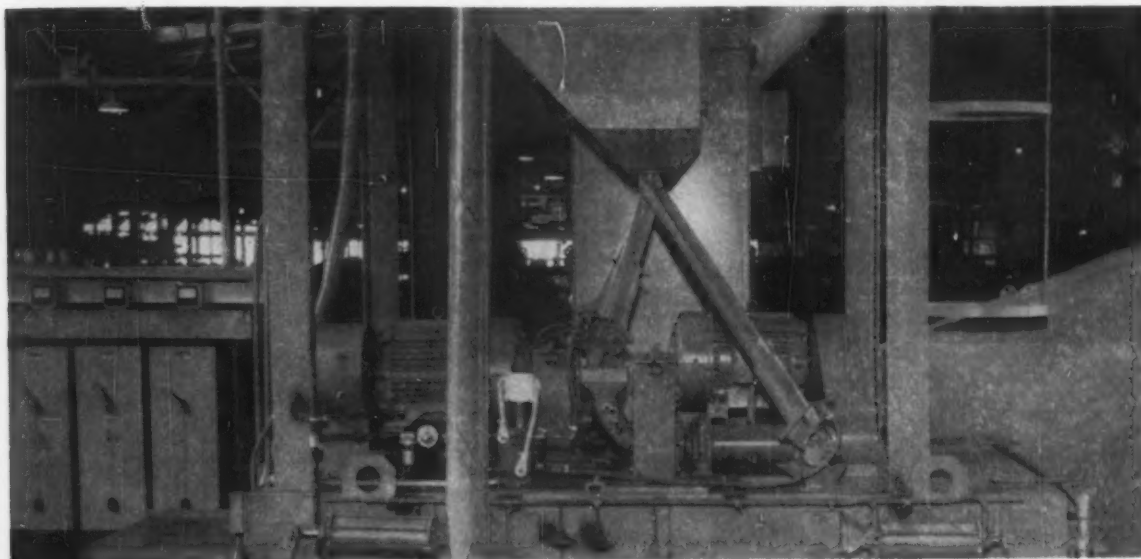
of the chamber and cast the shot in a similar pattern down at the rods. These wheels also rotate opposite each other. The pattern of one wheel is the reverse of the other.

The four patterns are so arranged that each wheel cleans about one quarter of the rod surface. The blasting zone is about 6 ft long. It's important that the rods don't rotate while in this area. If they did, one quadrant would be

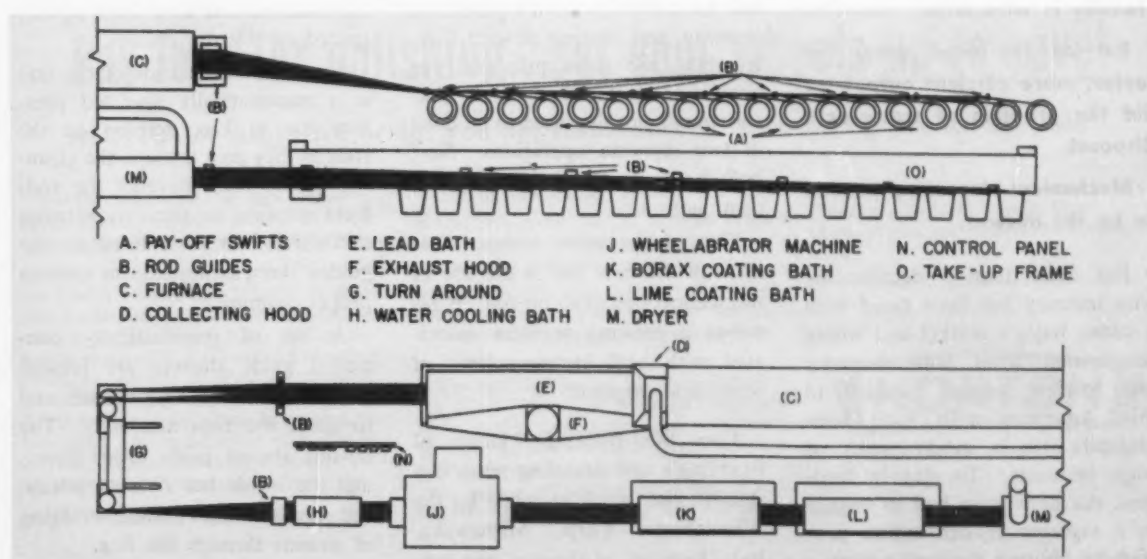
cleaned twice while one would be omitted altogether.

Each wheel is 19½ in. in diam and 2½ in. wide. Eight radial blades are spaced equally around the circumference. Rotating at 2250 rpm, each wheel projects about 700 lb per minute, and the entire shot charge of four tons recirculates through the machine in two to three minutes.

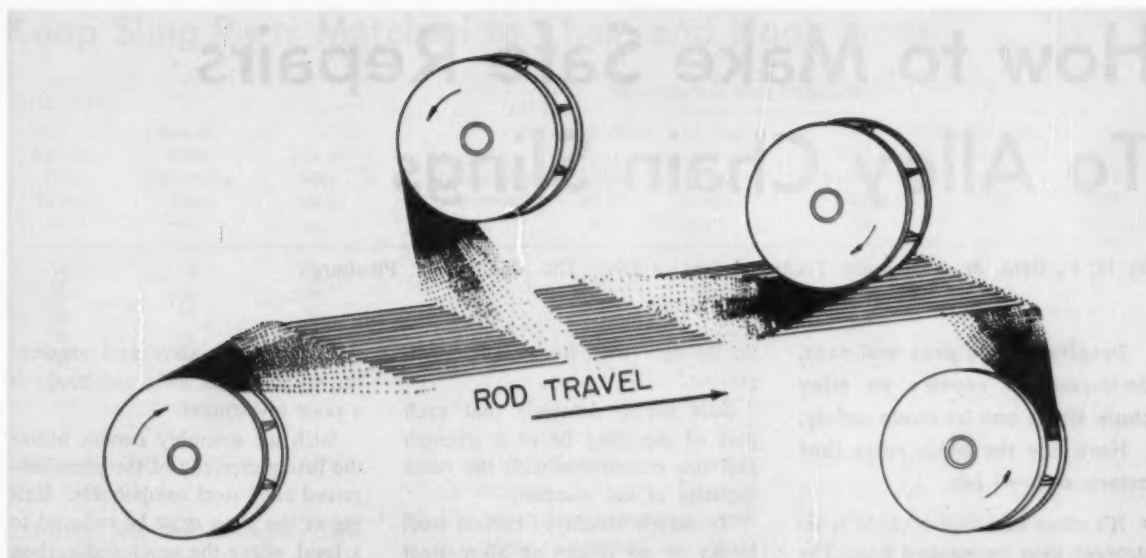
Saves Metal—When the con-



CONTINUOUS FEED: Cleaned shot is fed from overhead hopper to wheels by means of tubular chutes.



FAST PROCESSING: New rod patenting, cleaning and coating line at Roebling is geared to high output.



COMPLETE COVERAGE: Wheelabrator blast pattern is designed to give complete coverage of each strand.

tinuous rod line was first being considered, mechanical and acid cleaning were thoroughly compared. Without considering any other factor, mechanical cleaning has an edge—there's no waste disposal problem.

Both methods clean properly, but acid cleaning removes 0.1 pct of the base metal. Projecting this figure into Roebling's production rate, it means that 150 lb of steel are saved each day by mechanical cleaning.

Preliminary figures reveal that mechanical descaling is somewhat more expensive than the acid cleaning. But this is practically offset by the savings of steel, plus a potential market for the used shot and scale.

Before making the final decision, extensive research was conducted to determine the overall effect of shot-blasting on drawability and physical properties of the finished wire.

Scaled-Down Line — A trial model of the Wheelabrator was coupled with a rod patenting furnace to clean a single strand. Tensile and torsional properties of high carbon wire drawn from shot-cleaned rods proved similar to

those of finished wire drawn from acid-cleaned rods. Fatigue tests gave similar results.

A study was made to determine if the amount of shot-blasting affected physical properties. The amount of shot-blasting was varied by changing rod speed through the unit. Tensile, elongation, reduction of cross-sectional area, and Rockwell hardness tests were similar in all cases. Each sample was drawn several holes, but no difference was found.

All the material was drawn on standard machines by standard practices. Differences between acid and mechanically cleaned material weren't noticeable. Several different heats were tried during the tests to cancel out any error.

Bright, hard drawn wire was cleaned in the Wheelabrator to see if the unit could be used in a galvanizing line. Wrap tests on 1X, 2X and 4X diameter mandrels and Preece tests showed that cold drawn wire can be cleaned properly for successful galvanizing.

Appearance Differs — The surface of shot-cleaned rods differs quite a bit from that of acid-cleaned rods, but it doesn't seem to make any difference in the physi-

cal tests. The rod surface looks rather rough, with myriad small bumps over the surface.

Wearing of machine parts has to be expected. Wheel parts will last about 1000 hours. The steel "long-life" liners will last about 4000 hours. With this, plus the other small parts that may break or wear out, an inventory of spare parts should be on hand for efficient operation with little downtime. An hour meter connected to the wheel motor measures operating time and gives the maintenance group better control in scheduling necessary repairs.

Although the new unit has been in operation for only a few months, indications are that definite savings will be realized from it. And, again, it eliminates the big problem of waste-acid disposal.

The present unit is a pilot model. But the advantages are very real, and it appears likely that similar installations will follow.

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How to Make Safe Repairs To Alloy Chain Slings

By H. F. Reid, Jr.—Manager, Technical Service Div., The McKay Co., Pittsburgh

Despite all the pros and cons, do-it-yourself repairs on alloy chain slings can be made safely.

Here are the basic rules that assure a good job.

■ It's often said that a chain is no stronger than its weakest link. The do-it-yourself sling assembler might well paraphrase this adage to read, "A chain sling assembly is

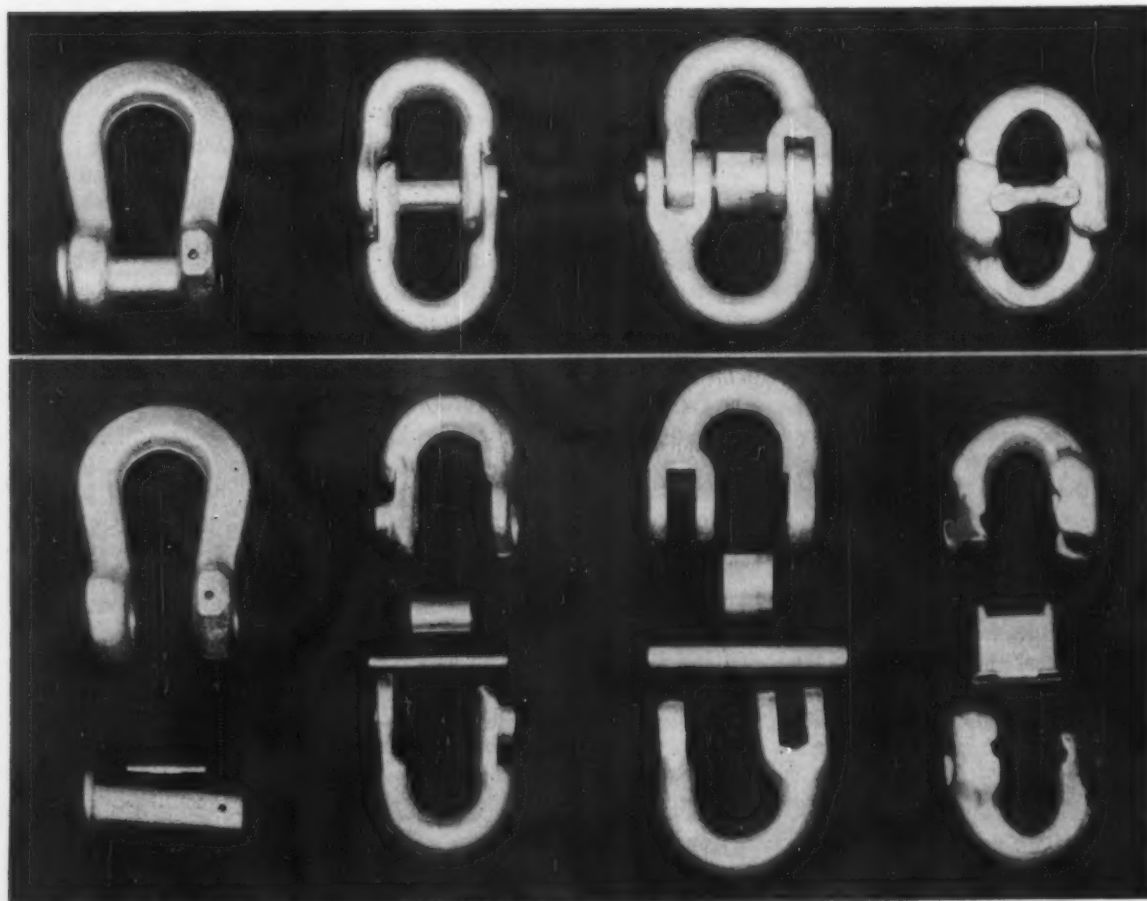
no stronger than its weakest component."

Safe lifting demands that each part of the sling be of a strength and size compatible with the rated capacity of the assembly.

To attach unalloyed carbon steel hooks to an otherwise alloy steel assembly and rate the assembly as an alloy sling is to invite disaster. Likewise, mating unalloyed carbon

steel chain with alloy steel connecting links, master links and hooks is a poor investment.

Such an assembly cannot utilize the lifting capacity of the premium-priced alloy steel components. Rating of the sling must be reduced to a level where the unalloyed carbon steel body chain can be used safely. As the months and years pass, the danger increases that this reduced



TYPICAL STYLES: Forged alloy connecting links come in a number of different designs. Sizes range

up to 2 in. diam material, factory-tested to 130-ton * loads, for proper matching to almost any chain size.

Keep Sling Parts Matched to Chain and Hook Sizes

Dimensions of Alloy Oblong Master Link

Size of Alloy Chain, in.	Size of Alloy Connecting Link, in.	Size of Alloy Hook, in.	For Single Sling			For Double Sling		
			Diameter of Material, in.	Inside Width, in.	Inside Length, in.	Diameter of Material, in.	Inside Width, in.	Inside Length, in.
1/4	1/4	1/4	5/8	3	6	5/8	3	6
3/8	3/8	3/8	3/4	3	6	3/4	3	6
1/2	1/2	1/2	1	4	8	1	4	8
5/8	5/8	5/8	1	4	8	1 1/4	4	8
3/4	3/4	3/4	1 1/4	4	8	1 1/2	6	11

rating will be forgotten or otherwise overlooked.

Match Size and Strength—Tensile and yield strength of steel in the various parts are important to safe operation. At the same time, however, strength of the material is of little importance if there isn't enough cross-section to support the desired load safely. Hook and connecting link must be designed to match the size and strength of the body chain. Dimensions of master links vary as the number of branches of the assembly increase.

Recommendations from various manufacturers of alloy chain may differ slightly from those shown in the table. But sharp reductions from these typical dimensions can be made only at the expense of safety when the assembly is used at its maximum safe work load.

Properly assembled, an alloy chain assembly made on-the-spot has the same safety and life expectancy as a matching assembly custom-made at the factory. Poorly assembled, the homemade assembly is a dangerous booby trap armed and waiting to cause trouble, injury or even loss of life.

Care Cuts Repairs—Where assemblies always are used within the recommended load limits and in an approved manner, there's seldom any need for repairs. Abrasive wear becomes the only factor shortening chain life.

All too often, however, chain assemblies are used with loads in excess of their safe working load

limit or in an improper manner which shortens chain life. Sections of the assembly become nicked, gouged, bent, stretched or otherwise rendered unsafe.

Should damaged assemblies be repaired using one or more alloy connecting links? Will the resultant assembly be as safe as it was originally? There is no clear cut answer to these questions. The answer depends on the individual user and his concept of what is meant by the term "repair."

If repair means to insert a length of new chain between the master link and hook, then the answer is yes. Field repairs always can be made quickly and safely with two alloy connecting links of the right size and a length of new alloy chain. The repaired area will be as good and as safe as new in a matter of minutes.

Don't Go Halfway—If, on the other hand, repair means to join two ends of a broken alloy chain with an alloy connecting link, the answer is emphatically no. The resultant assembly may be useable, but it can't be considered safe.

Seldom is damage to a chain assembly restricted to a single link. A single link may have failed, but adjacent links usually have been damaged nearly to the point of failure. Joining two such pieces of abused chain with an alloy connecting link assures other chain failures—and soon.

Adequate supervision and knowledge of the general traits of chain

wear and damage are prime requisites for safe use of alloy connecting link in field repairs.

Inspect Regularly—Properly assembled alloy chain assemblies made on-the-job can be used with the same assurance as a factory-made sling. Continued safe operation of both types of assemblies requires periodic inspection.

Alloy connecting links will not be deformed or elongated by normal use. A load in excess of the proof load of the chain (twice the recommended safe working load limit) is needed to permanently elongate the connecting link. Loads in excess of the proof load of the alloy body chain will damage the alloy connecting link in much the same way that such loads permanently damage the body chain.

Elongated or otherwise distorted connecting links should be replaced at once, and the entire assembly inspected critically for signs of damage to one or more of the other parts.

More Bearing Areas—Wear at the bearing surfaces of an alloy connecting link is a more pressing problem than normal chain wear, because there are more bearing surfaces. In addition to wear at the end bearing surfaces, wear at all the other points of possible friction must be considered and watched.

Many commercial alloy connecting links use a pin of some type to fasten the forged sections together. Wear on this connecting pin must be checked periodically.

How Nickel Affects High-Speed Tool Steels

Part 1

By R. F. Hehemann, Assoc. Prof., and A. R. Troiano, Prof. and Head, Dept. of Metallurgical Engineering, Case Institute of Technology, Cleveland.

Nickel is a beneficial alloying addition to many modern structural steels. Why not the high speed steels?

Part 1 of this authoritative article considers the matter of annealing both standard and nickel-containing grades.

Structural steels designed for severe service usually contain nickel as a principal alloying element. Nickel contributes to the superior performance of these steels at low temperatures, high strain rates, and other conditions requiring resistance to notch sensitivity. Yet tool steels—and particularly high speed steels—are rarely alloyed with nickel. Why?

There seem to be two reasons.

For one, the relatively simple annealing cycles used for the standard high speed steels won't work when nickel content is appreciable. Thus, the steels are not readily softened for easy machining.

Retains Austenite—Secondly, there is the propensity of nickel steels to retain austenite on quenching. Excessive amounts of retained austenite might limit the maximum hardness attainable. Normally, this should not be less than Rockwell C-64 for steels of this type.

If its introduction were commercially feasible, what could nickel contribute to high speed steels? It might improve ductility and resistance to shock loading. Also, it might be expected to provide other benefits generally associated with its

addition to structural steels. This could result in a class of steels with a combination of properties not currently available.

Check Nickel—A recent test program, conducted at Case Institute of Technology and sponsored by the International Nickel Co., Inc., explored some of these possibilities through a study of the transformation characteristics of high speed steels. Limitations imposed by nickel on the ability to soften, and then to harden, high speed steels were examined for two standard

Part 2 of this article, dealing with the hardening characteristics of nickel-modified high speed steels, will appear in the Dec. 25 issue.

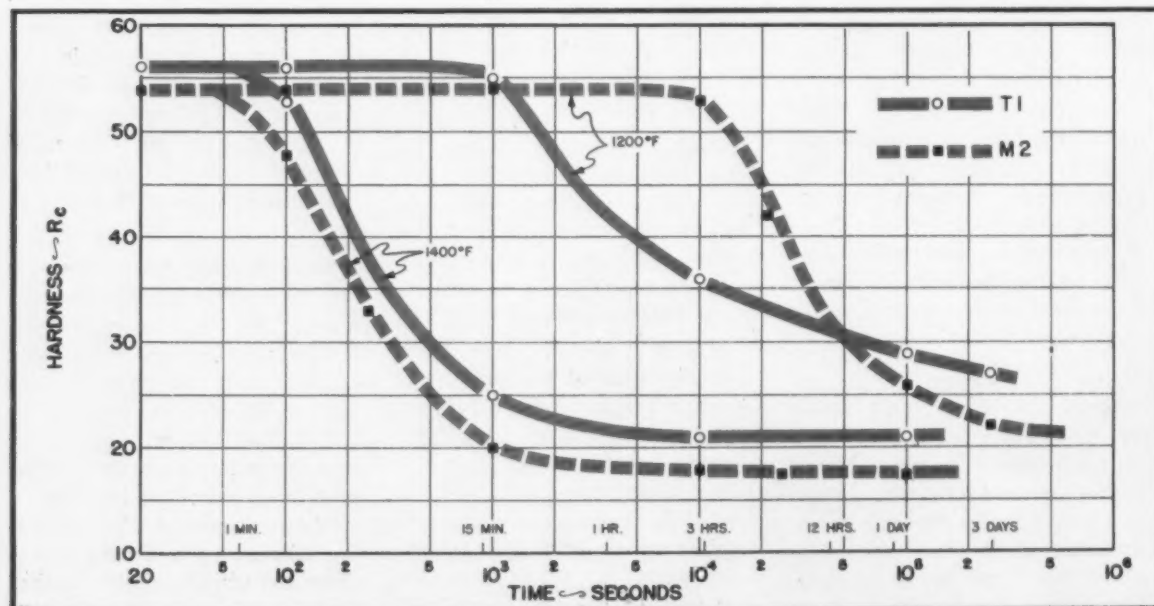


FIG. 1: Hardness isotherms of T1 and M2 steels, austenitized 1 hour at 1600°F.

analyses with and without an addition of nickel. Steel analyses are shown in the table.

The two nickel steels were made from 30-lb, 4-in. square ingots, forged to 2 in. and hot rolled to 5/8-in. square bars. After hot rolling, these bars were annealed by holding at 1600°F for 1 hour, dropping to 1350°F for 3-4 hours, and then furnace cooling. The standard analyses (also 5/8 in. square) were commercial steels and were received in the annealed condition.

Heat Treatments—Only the nickel-modified steels were given a preliminary heat treatment in order to soften them for machining. This consisted of holding at 1150°F for 16 hours. It provided a hardness of Rc 33-35.

Normally, high speed steels are softened by annealing from about 1600-1650°F. This treatment may involve either slow cooling (at a rate less than about 40°F/hour) from the austenitizing temperature, or isothermal annealing for 3 to 4 hours at 1350-1400°F. Success of either of these methods depends on the complete decomposition of austenite at temperatures just below A_1 .

Effects of Nickel—To determine

Composition of High Speed Steels

Steel	Class	C	Mn	P	S	Si	Cr	V	W	Mo	Co	Ni
T1	18-4-1	.74	.33	.025	.020	.33	3.96	1.15	17.88	.34	.12	.13
T1+Ni	18-4-1	.74	.28	.021	.030	.12	4.48	1.00	17.99	.38	.23	2.92
M2	6-5-4-2	.85	.35	.027	.025	.29	4.11	2.00	6.40	5.10	.12	.14
M2+Ni	6-5-4-2	.85	.55	.023	.036	.25	4.61	1.77	6.38	4.93	.01	3.10

the A_1 temperatures, a dilatometric method employing a heating rate of 8°F/minute was used. Typical dilation curves were obtained. Approximate value for A_1 for all four steels were: T1 and M2 — 1540-1560°F; M2 + Ni — 1320-1350°F; T1 + Ni — 1340-1360°F.

The A_1 temperatures of these high speed steels are lowered significantly by the addition of 3 pct nickel. Because of the relatively high heating rate employed, the true A_1 temperatures (particularly for the nickel steels) are lower than those reported.

As a guide for the choice of isothermal annealing treatments, TTT diagrams in the pearlite range were

determined for the four steels. These diagrams, for an austenitizing treatment of 1 hour at 1600°F, were compared for the T1 and M2 steels with and without nickel.

Lowens Nose—Nickel lowers the temperature of the pearlite nose from about 1400°F to 1150°F. This reflects the reduction in the A_1 temperature. Of greater commercial interest is the retardation of transformation imposed by the nickel addition.

The time for completion of transformation was increased from about 45 minutes for the standard steels to about 3 days for the nickel-modified grades. These exceptionally long transformation times may be partly attributed to the relatively

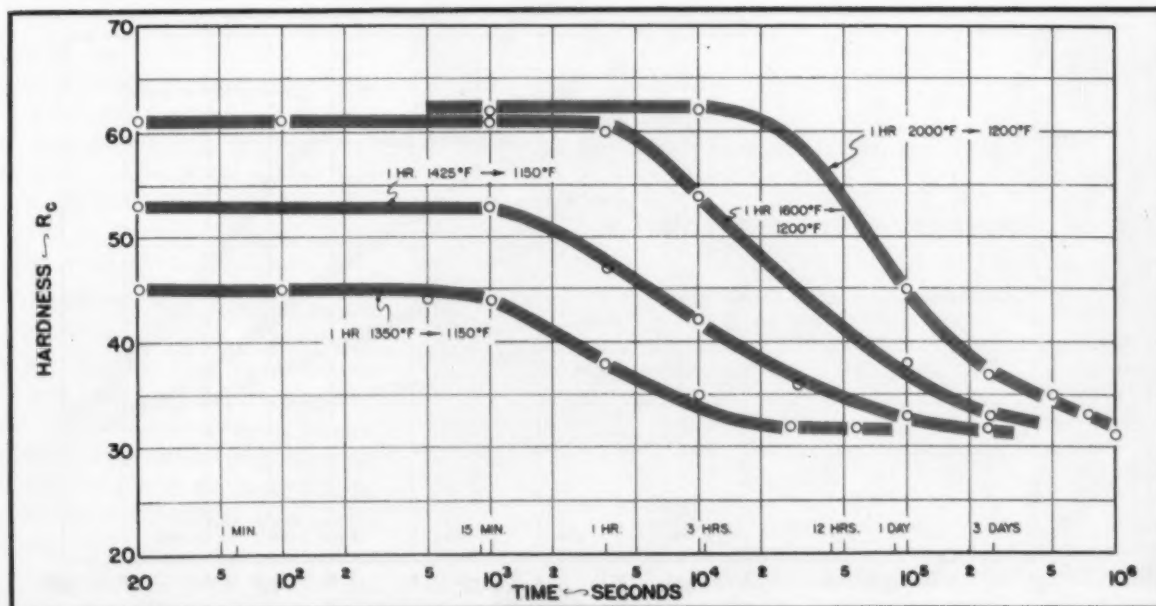


FIG. 2: Influence of austenitizing temperature on hardness of isothermally transformed T1 + Ni.

low temperature of the pearlite nose. This temperature was insensitive to austenitizing temperature in the range 1350-2000°F.

Lower Hardness—The standard T1 and M2 steels can be conveniently softened by subcritical isothermal transformation. Hardness isotherms at 1400° and 1200°F for an austenitizing temperature of 1600°F are shown in Fig. 1. Both steels attain a hardness well below Rc 30 at either transformation temperature. Time for complete transformation at 1200°F is excessively long.

For the nickel-modified steels, the influence of austenitizing temperature on the hardness of specimens isothermally transformed at the pearlite nose (1150°F) is shown in Figs. 2 and 3. Hardenability increases rapidly as the austenitizing temperature is raised. Shortest annealing involves austenitizing at 1350°F and transforming at 1150°F. This gives Rc 32 in 6 hours for T1 plus Ni and a hardness several points higher for M2 plus Ni.

Critical Carbides—The hardness range of Rc 32-34 is dictated by the particular carbide distribution re-

sulting from this short annealing cycle. (Based on specific machining operations, this hardness range is within machinable limits.) This carbide distribution is controlled by the low austenitizing and transformation temperatures that must be used.

The behavior of the nickel steels austenitized at high temperatures (Figs. 2 and 3) indicates that these steels also would attain hardnesses below Rc 30 if given time for complete transformation.

Two Choices—Essentially, this means that with the nickel steels a choice must be made between two alternatives. On the one hand, there is a combination of low austenitizing temperature (1350°F), many undissolved and very small carbides, a short time cycle, and a hardness of Rc 32. The alternative is a combination of a high austenitizing temperature, fewer undissolved and larger carbides, an excessively long softening cycle, and an ultimately low hardness.

A number of other softening treatments were also investigated. These included tempering of the as-received material, cyclic annealing, and slow cooling treatments.

Other Approaches—Tempering in the range of 1150-1200°F for 8

to 10 hours produces a hardness of Rc 32-34 for both nickel steels. Extending the tempering time beyond about 10 hours is of little value. A hardness of Rc 31 was obtained with nickel-modified T1 after 3 days at 1150°F.

When the tempering temperature exceeded about 1250°F, hardening accompanied the tempering treatment. This results from the low A_1 temperatures characteristic of the nickel steels.

Cyclic annealing treatments involving temperatures above and below the critical were investigated. Although several of these treatments also yield a hardness near Rc 32, none offer any advantage over the simple isothermal anneal from a low austenitizing temperature.

Attempts to soften the nickel steels by furnace cooling from 1400° and 1550°F were unsuccessful. The hardness resulting from these treatments was above Rc 35 but could be lowered to Rc 32 by reheating at 1150°F.

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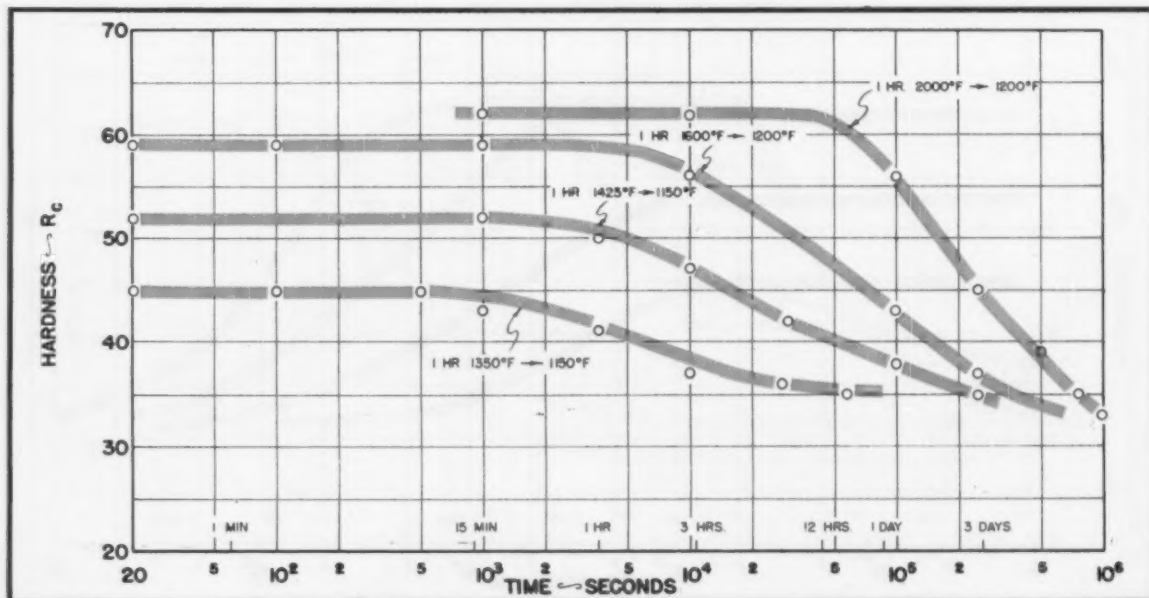


FIG. 3: Influence of austenitizing temperature on hardness of isothermally transformed M2 + Ni.

Hose Makes Good Work Clamp

Long workpieces need support throughout their length.

Instead of using multiple clamps, here's a fixture that uses fast-acting air pressure.

■ A new holding fixture has solved the problem of costly set-up time on spindle shapers and traveling routers. Gone are conventional clamps and clamping devices.

In their stead is a pneumatic unit, called a Merriman "wind-jammer." It's a new application by tool engineers at Boeing Airplane Co., Seattle, for a device that normally actuates movable dies and switches.

Tackles Bottleneck — According to John Breeze, Boeing tool engineer, time required for setting up and operating shapers results in a bottleneck. Fixed-position clamps not only add weight and massiveness, but also require time for adjustment. Additional small hand clamps have to be positioned and often changed during the course of a production run.

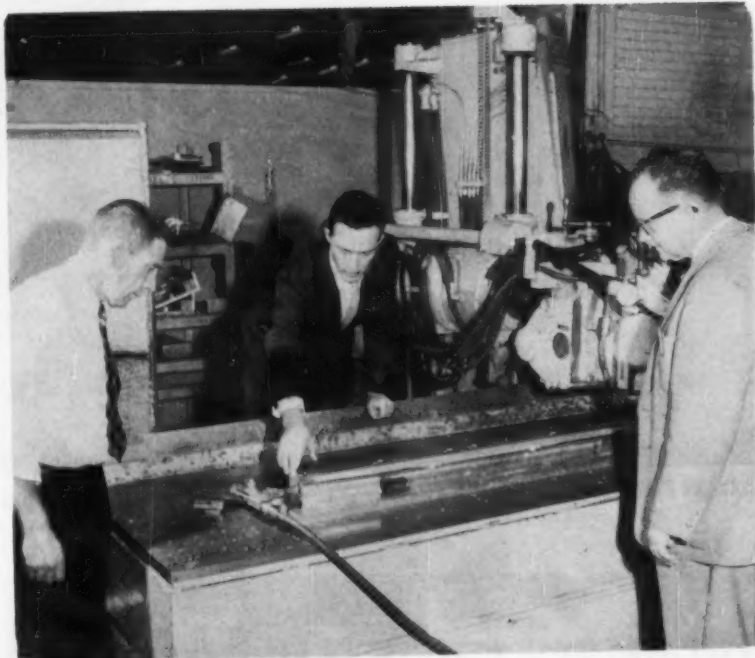
Consisting of a neoprene-Dacron hose, the new device holds parts firmly against a nesting block. Running the full length of the part, the hose exerts a pressure of 4000 psi when inflated.

After shaping, the finished part is removed easily by opening a pet-cock on the valve fitting to release the pressure.

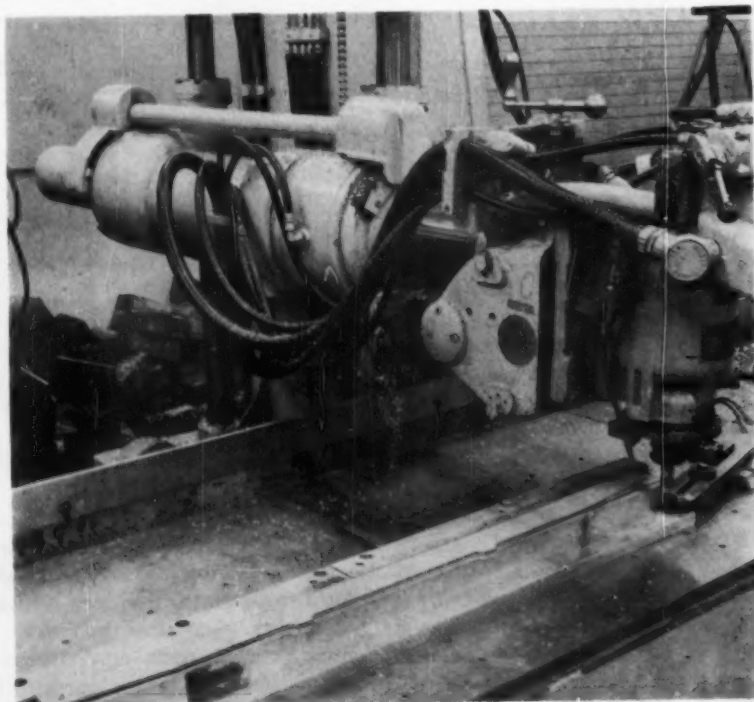
Cuts Machine Time—A try-out run proved the value of the new set-up. Machine time on production parts went down 58 pct.

In addition to savings in production costs, tooling costs were reduced one third. On larger fixtures, further cuts in tooling costs can be expected.

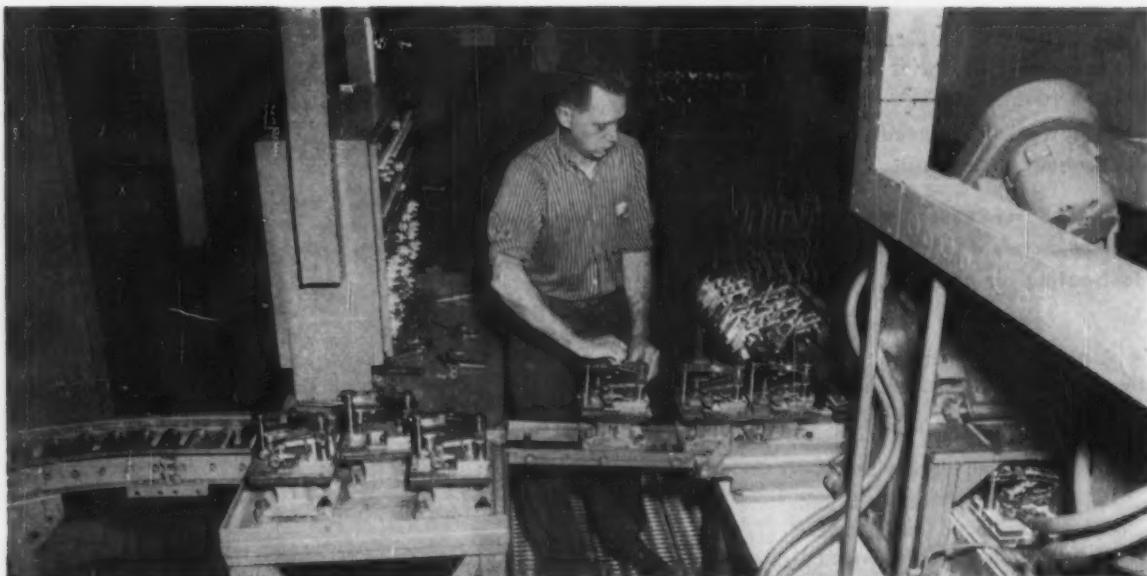
Machine operators find the fixture easy to handle because of its light weight and simple design.



STRESS SIMPLICITY: Boeing tool engineer points out simplicity of fixture in use on traveling router. It reduces machine time 58 pct.



SPEEDS MACHINING: Once fixture is set, there's no adjusting to interrupt machining. Running full length of part, hose exerts 4000 psi pressure.



LOAD POINT: Operator places spray gun blank on pallet fixture for fast trip through transfer machine.

Make Transfer Machines Do More

This Automatic Line Handles Six Different Parts

The benefits of automatic transfer machining aren't limited to mass producers.

Smaller firms can also put the technique to good use.

■ When can a producer of a diversified line of products make automation pay? How far can you afford to go toward an automatic transfer machining line? What problems does the smaller manufacturer face when he considers automating, and how can he tackle them?

These challenging questions have no easy answers. But the experience of DeVilbiss Co., Toledo, affords some clues. Management felt it could not afford to overlook the advantages of automatic processing, despite the variety of items the firm manufactures.

Flexibility Needed — Volume is

likely to be a stumbling block for many companies, says William A. Delger, manufacturing vice president. "You must have enough production to keep the line busy," he warns. "Otherwise you just can't make it pay."

Delger points out that one approach is to look for a group of similar parts, then see if equipment can be devised to handle them. That's what DeVilbiss did. It started with one of its highest volume lines: spray guns. Then it prepared specifications for machining six different models of these.

This meant some deviations from the usual automation concepts. For instance, the line had to be tooled for a ready switch from one model to another. Altogether the firm expects to make about nine changes in production a year.

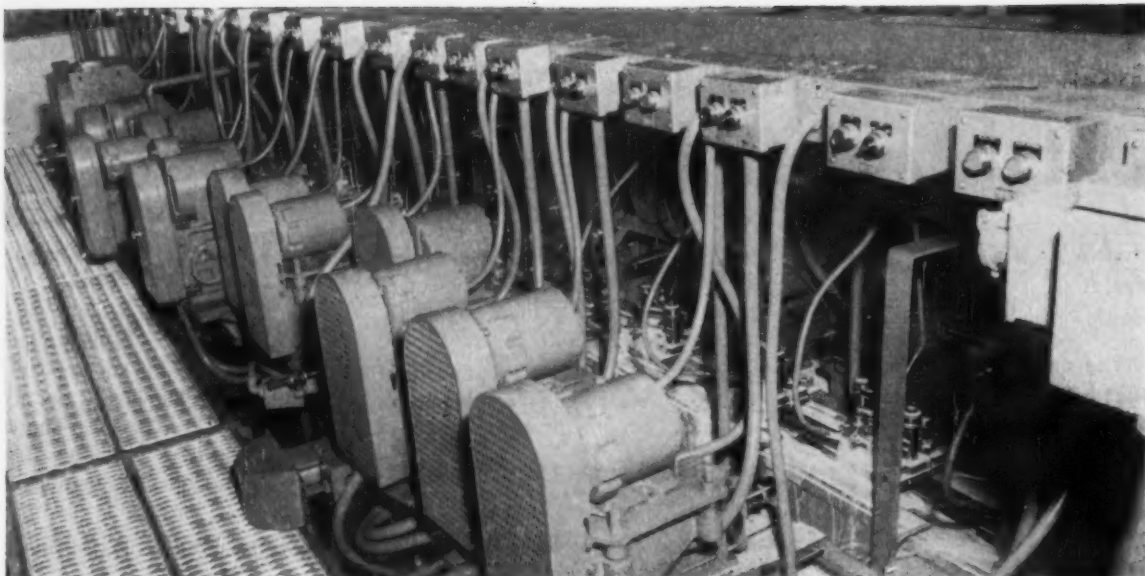
Changeover Not Simple — Because setup for a model change

takes from five to seven days, runs are planned and scheduled on an annual basis. The special transfer machine was built by Swift-Ohio Corp., Kenton, O. It has some 39 stations with 54 units to drill, ream, bore, counter-bore, spot face, mill, trepan, thread, tap and chamfer.

Various models of spray gun bodies fit into the basic work-holding fixtures. The machine is of the closed-circuit type, with pallets. These transfer automatically to the starting point for unloading finished parts and reloading with blanks.

Changeover of the line to a different model involves minor changes to the holding fixtures, such as locating pads. Major changes must be made in tools and machine heads because operations performed on any one blank vary from 20 to 54.

Substantial Gains—The line is designed for a production rate of



ON THE WAY: Some 39 stations having 54 machining units do a thorough job on various spray gun models.

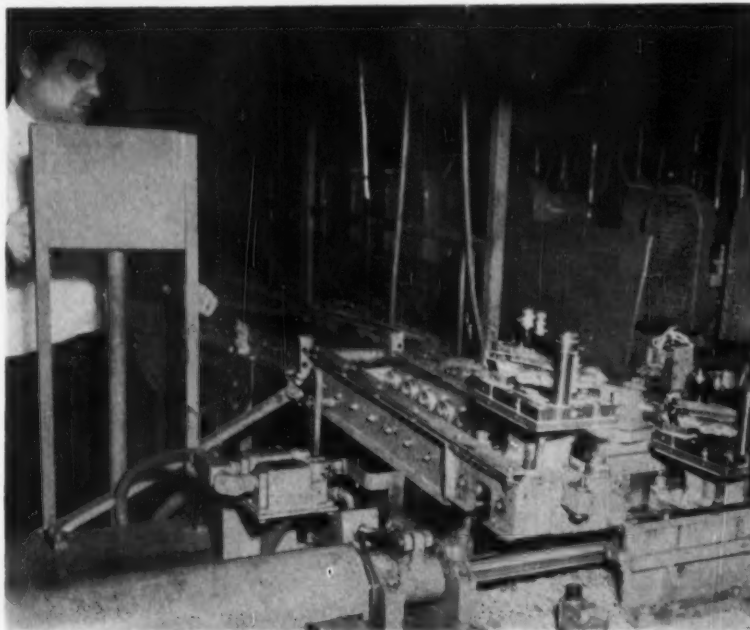
120 gun bodies per hour. It can work to tolerances of 0.001 to 0.002 in. It machines gun bodies complete, except for a preliminary machining which establishes the locating pad and hole.

It's estimated that the new line has cut processing costs as much as 47 pct. Production is equivalent to that of 100 men working on a job-lot basis with 20 multiple duty machines. The set-up needs only one operator to load and unload parts, one to service and change tools and another to operate the automatic pre-processing lathe.

Tryouts Teach Workers—Before it shipped the machine, Swift-Ohio give it a complete tryout on several of the DeVilbiss models. During this time the builder helped the personnel who were to operate the machine become completely familiar with it.

Since many firms don't have large technical staffs, it's best to pull out a good technical man, according to Delger, and let him live with the new machine. Thus you have your own expert, who has a personal interest in smooth operation.

DeVilbiss experience shows that the earlier your technical people enter the picture, the better. That



RETURN POINT: Automatic elevator lifts fixture, then drops it on conveyor which brings finished workpieces back to start of line for unloading.

way solution of problems—particularly tooling—can be a cooperative venture.

"Tooling for versatility like this is ticklish," admits John Petser, DeVilbiss master mechanic. He points out that the user can't expect the machine builder to under-

stand all the ramifications of chip removal, materials, inspection, and other factors that are involved.

Getting used to automation concepts and controls takes time and patience, the firm's engineers admit. But the first installation makes the next one that much easier.

Automation Units Solve Batch Assembly Problem

How do high-speed automatic cycles fit into small-lot production?

The answer's seen in a setup that adapts to quick change.

▪ Even if designed for automated production, high-speed attachments can adapt to smaller, more complex batch assembly.

Typical is a case of inserting set screws. This batch-type operation

at SKF Industries, Inc., Philadelphia, involves the inserting of 11 size-length combinations into one of more than 20 sizes of collars.

First considered all but impossible to mechanize, it turned out to be surprisingly easy to get more efficient, lower-cost assembly. The solution was found in a new high-speed set screw inserter.

Hand Feed Parts—Designed to make up to 2500 insertions per hour, it's intended primarily for a fully automated line. But SKF gets a respectable rate of 1200 insertions per hour with an operator hand feeding the collars.

It permits quick changes for automatic feeding of the different size screws. Called Setomatic, the versatile unit is made by Standard Pressed Steel Co., Jenkintown, Pa.

The setup meets more than 90 pct of SKF's collar assembly requirements. Only the larger sizes are still inserted by hand.

Check Savings—Based on assembly-rate cost figures, savings are running at \$4000 per year. This takes into account the monthly rental of the screwdriving unit at \$62.50.

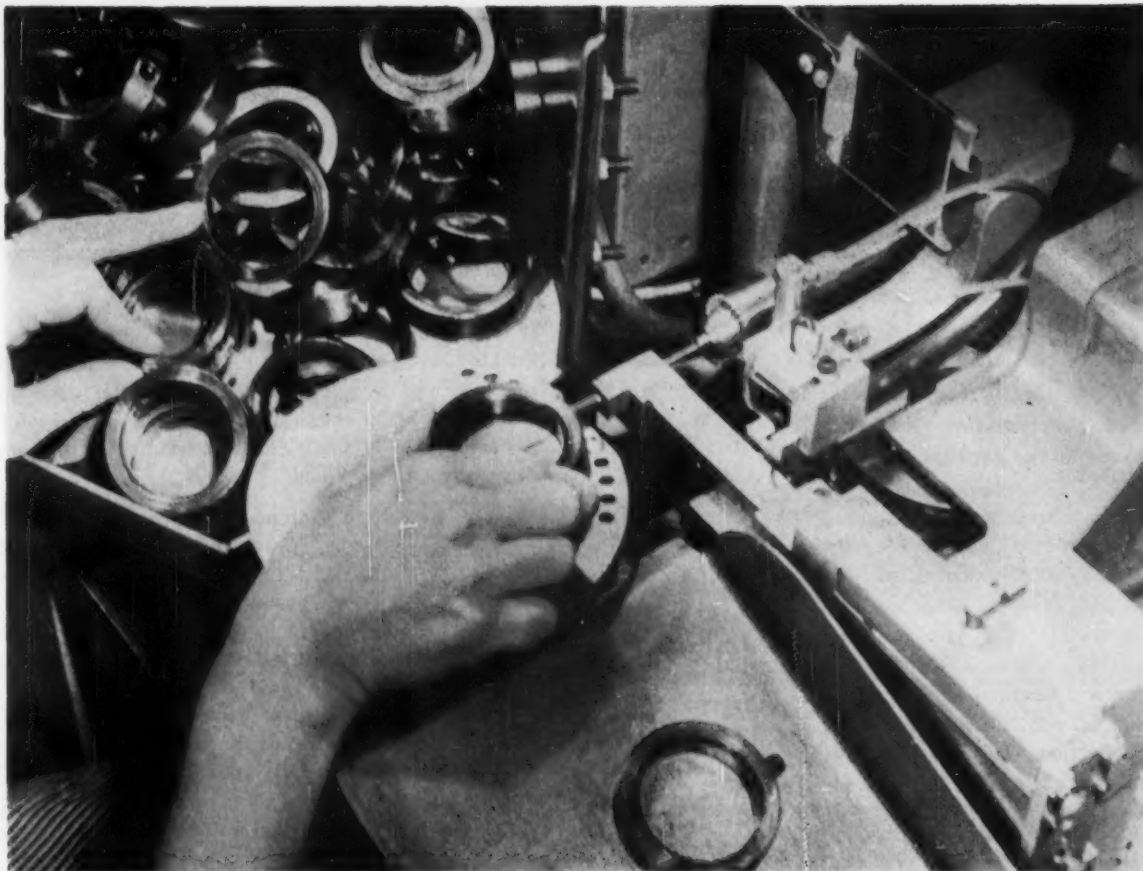
Assembly costs are reduced by two-thirds. A typical ¼-in. set screw, costing 71¢ per 100 insertions by hand methods, now costs 23¢ per 100. A ⅜-in. size formerly costing 94¢ per 100 now costs 27¢ per 100.

The setup installs screws in four basic diameters, ranging from 10-32 x 3/16 size to ⅜-in. by ¾-in. length. Typical production rates on a collar requiring one screw have risen from 303 per hour to 917 per hour, a boost of 200 pct.

Stress Quick Change—The batch nature of the operation, plus the variety of collar sizes—some with



READY FOR BATCH: Operator loads vibrating hopper. She's then ready to press foot pedal and hand feed collars to automatic screwdriver.



SETS BRISK PACE: As operator places collars against lugs, driving spindle inserts screw to preset depth. A

slip clutch on the spindle prevents damage on meeting poorly-tapped hole or damaged screw.

two set screws, some with one—made the mechanizing job appear difficult. It's the quick-change feature of the unit that makes it feasible.

The inserting machine consists of two basic parts: the screw supply system and the drive mechanism. Picking up screws from a vibrating supply hopper, the screw supply system orients them and feeds them into a driver feed tube.

The drive mechanism takes screws from the feed tube and inserts them into the tapped holes. Since the set screw is only inserted into the hole and not tightened onto a shaft, the machine inserts the screw to a preset depth to insure bore clearance.

Spiral for Pickup — Screws are dumped loose into the hopper at top of the machine. A spiral track built

into the side of the hopper picks up the screws and carries them up to the feed tube.

At the mouth of the tube a selector fitted with a pin passes screws that are facing in the right direction and turns back screws pointing the wrong way.

Air pressure feeds the screws into the driving unit. When the tube is filled, the feeder unit stops automatically and resumes when supply of screws in the tube drops below a predetermined level.

Two at Once—Two machines can be mounted as close as 90° to each other for inserting two screws simultaneously with single control.

SKF has added its own accessory equipment:

A hopper bin supplies collars, while a table-loading fixture with

movable pegs adjusts to different collar sizes. Supply trays and delivery chutes complete the setup.

Once the assembly department's setup man has adjusted the machine for screw and collar size, the operator merely fills the vibrating hopper, presses a foot pedal and hand feeds collars while the machine cycles automatically.

Safety Factor — On meeting a poorly-tapped hole or damaged screw, the drive mechanism foreshortens its stroke. A slip clutch on the driver spindle prevents damage to both the product and the machine.

A future benefit to be gained from the automatic unit is that it will be able to keep up with production growth. It's possible to get the full rate of 2500 screws per hour with automatic feeding of collars.

Reduce Manual Handling To Boost Forging Output

By Herbert Chase—Consultant, Forest Hills, N. Y.

Want to make more forgings in less time? Try mechanizing and synchronizing the various steps in the process.

■ Ways to forge better automobile parts in less time are sought constantly at Buick's Flint, Mich., plant. Very often, the search pays off.

One example is the forged blank for a differential side gear. It's a simple, conventional piece. But its production rate was recently increased about three times by adding more mechanization to a pair of single-blow, hot-heading machines.

Consume Bars Quickly—Stock for the forgings is SAE 1132 steel in bar form, 2 in. in diam, 59 in. long. Single bars, heated to 2250°F, are fed progressively into the headers. They're consumed quickly, without any need for reheating.

A 3½ lb section (enough for one blank) is automatically sheared off just before it's headed. A special pusher device with handles aids manual advance of the bar to a stop setting each time the dies open.

A rocking transfer arm works with the shear blade to hold the sheared-off piece until it is picked up and held by spring action in the

machine ram. At this point the shear blade and transfer arm retract. The workpiece advances for single-blow die heading as the ram closes.

Automatic Advance—As the dies open, the forging is ejected and falls into a chute. The operator pushes the remainder of the hot bar forward and the shear blade and transfer arm advance for the next cycle.

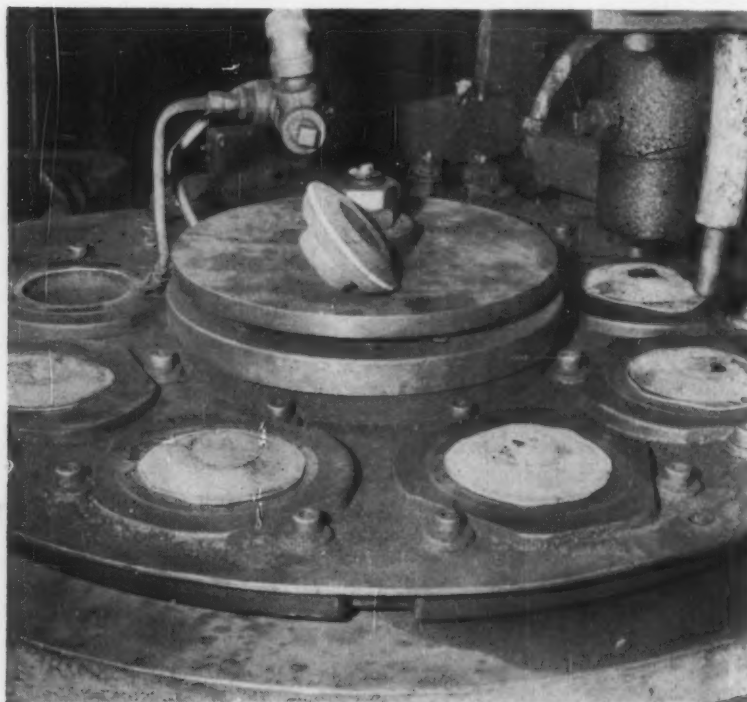
Except for the manual push on the bar stock, the header runs continuously and automatically. Output is about three times greater than when a three-blow header was used, with hand transfer between blows.

A conveyor lifts the hot forgings from the ejection chute into a tote tub. They're cooled before they're transferred to a dial-feed, cold-trim press.

Trims Cleanly—An operator hand loads the dial. Each time it indexes a blank under the punch the press trips automatically. This pushes the forging through the trim die, leaving the flash on top of the die. The retracting punch strips off the flash. When the dial indexes again, air jets blow the flash into a scrap box.

Because trimming is faster than the heading operation, the trim press does not run continuously.

Forge Knuckles Fast—Another high production forging is a steering knuckle made from SAE 1040 steel and weighing about 12 lb. Billets for these forgings weigh 16½ lb and are made from 3½-in. square bars with rounded corners. Billets are necked to a 5½-



COLD TRIM: Punch at right presses forged gear blanks through trim dies in dial index table. Piece at dial center has been trimmed.

in. long tapered section at one end before they're shipped to the Buick plant. Each one is about 11 in. long overall.

Billets are heated to 2200°F in a continuous furnace. They are discharged automatically in step with the operation of the forging press, a 3000-ton Ajax unit.

Discharged billets go through a descaler where they're hit by jets of air and water at 1500-psi pressure. This high-velocity scale removal is so effective that billet temperature drops only slightly.

Three-Die Process—From the descaler, billets move to a table where a press helper picks them up with tongs and passes them to the press operator. The operator loads each billet into the first of three die impressions. This flattens the square billet to a thickness of about 1-11/16 in.

The second die cavity does additional forming of the upper and lower arms while the spindle extension projects into a die hole. The next step is a delayed kickout, followed by transfer to the third and final impression. This gives the forging its final shape, including recesses, spindle steps, and radii. The workpiece then ejects to a conveyor for advance to the trim press.

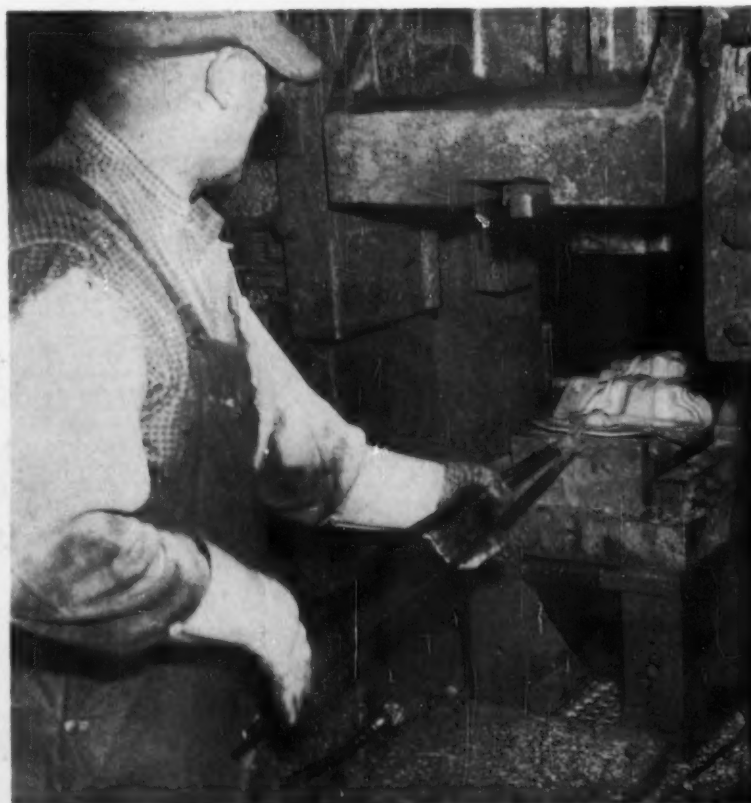
Trim Hot Forgings—Trimming is a hot operation. The forging flash is generally horizontal and the spindle projects into a hole in the trim die. The next step is a final straightening and coining that brings important dimensions within 0.005-in. to 0.015-in. tolerance limits.

Knuckle forging output from this setup is about 160 pieces per hour, or about 1280 per 8-hour shift. The five-man crew includes a furnace loader, two men at the forging press, and one each at the trim and coining presses. When higher production is needed, duplicate equipment is operated by extra crews.

Coined forgings are cooled in tote tubs before they're blast cleaned, inspected, and sent to an adjacent plant for machining.



ALL SET: Heated to 2200°F and descaled, this necked-down billet for a knuckle component is ready for the first of three die forgings.



HOT TRIM: Spindle of the finished knuckle forging extends downward into a hole on this die which trims flash prior to final coining.

Remote Control Simplifies Short Run Scheduling

Panels in a central control room keep a running score of machine tool output.

■ In a quiet room 2000 yards away from the punch press department, a production control supervisor at Milwaukee's John Oster Mfg. Co. scans a panel board.

The status of any press in the shop is clear to him at a glance.

Pick one at random. They're all numbered on the panel. This one is supposed to make 5000 stampings for an Oster appliance before 3:30 pm. It's halfway through the run now. Every stroke it makes registers on a counter, right before your eyes.

A few spaces down on the panel a green light starts flashing. At the same instant you hear a "beep."

"This press just finished its run," the supervisor explains. He points to the job-total indicator which was preset before the run started, then shifts his finger to the parts-counter register. Sure enough, the figures match.

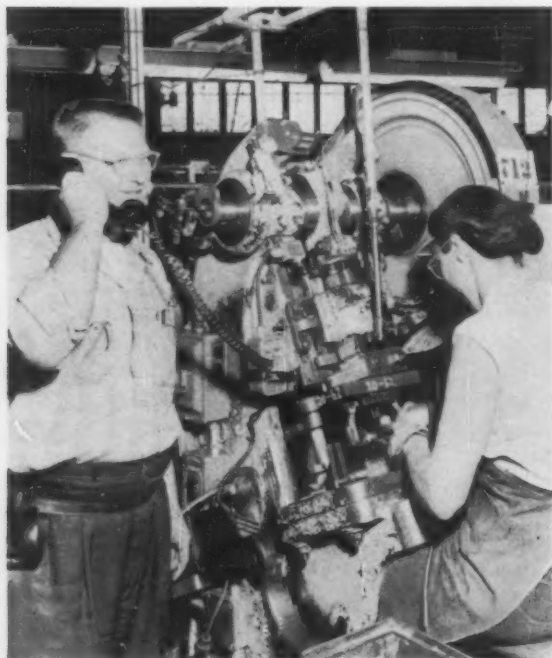
Warns of Trouble—At the top of the panel there's a red light flashing now. "Trouble on this press," he frowns. He grabs a microphone, calls the press foreman, asks him to check on the offender.

In the shop, the foreman hurries to the press in question. He plugs a telephone handset into a control box at his elbow, rings the control room. "The machine's OK," he tells the supervisor, "it just ran out of strip stock. Order some right away, will you?"

This is how Oster uses remote control to keep tabs on short run schedules for a host of machine tools. Production from more than 500 machines must be carefully matched to competing demands from the firm's 18 parts-assembly lines.

Three-Way Benefits—The setup was designed, built and installed by Telecontrol Div., Hancock Industries, Jackson, Mich. Tried first in the press department, it proved out there by eliminating overruns, delivering exact piece counts instantly, and boosting efficient machine use sharply.

The system is now being extended to the gear cutting department. By the end of next year, it will be monitoring output of every machine tool in the plant.



QUICK ACTION: When a panel light shows that any press needs attention, control supervisor (right) calls the



foreman. Foreman (left) checks, plugs in phone, reports his findings for necessary follow-up action.

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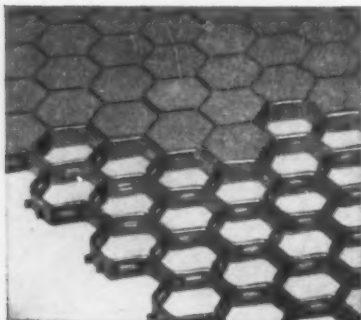


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Many factors often overlooked in selecting power cylinders for specific jobs are discussed in a data sheet. Some relate to operating conditions; others involve cylinder design and material. (Miller Fluid Power Div.)

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Machine Tools

A new belt sander is one of the tools described in a 52-page catalog. Also dealt with are: band saws, contour saws and band filers, jig saws, saw jointers, saw tables, shapers and shaper cutters, drill presses,

tool and knife grinders, jointers, lathes, planers, belt and spindle sanders, spinning tools, motors, controls, supplies and accessories. (Boice-Crane Co.)

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Laminating Epoxy

A new laminating epoxy resin for tooling and equipment is introduced in a bulletin. It states that the material has high flexural strength, low cold creep, short cure period, is low in price and easy to handle. (Rezolin, Inc.)

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Steel Cabinets

A 4-page bulletin introduces a line of steel storage cabinets. (Penco Div., Alan Wood Steel Co.)

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Conversion Coating

Fully automatic, a straight-line conversion coating machine is described in a 4-page bulletin. Also described is a processing barrel. This has a cover which opens and closes automatically to receive and discharge work loads. (Hanson-Van Winkle-Munning Co.)

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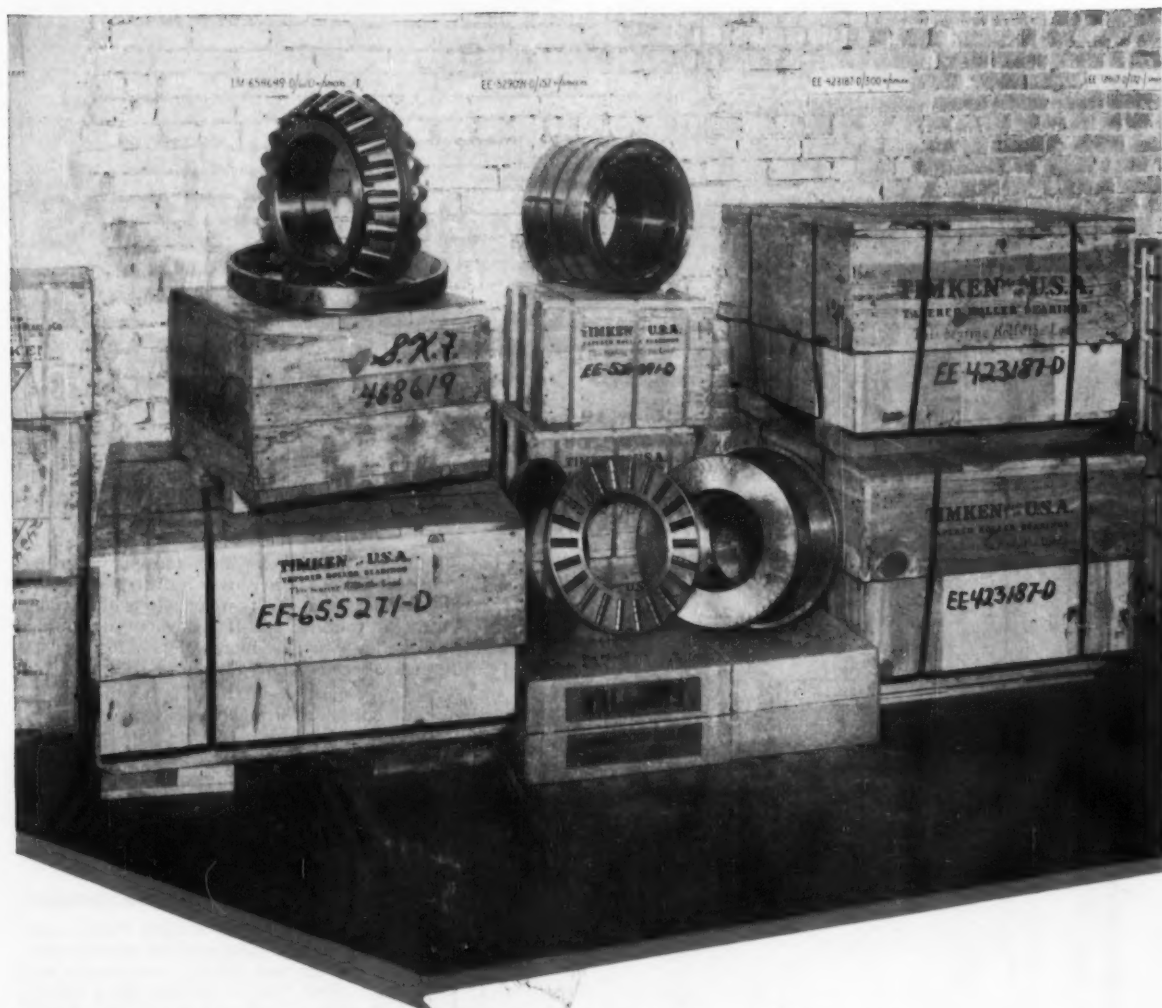
Thermometers

Stainless steel thermometers are shown in an 8-page booklet. More than 100 angle form, straight form and special-purpose thermometers are available. (W. C. Dillon & Co., Inc.)

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Process Equipment

An 8-page brochure details equipment for mining, chemical, stone,



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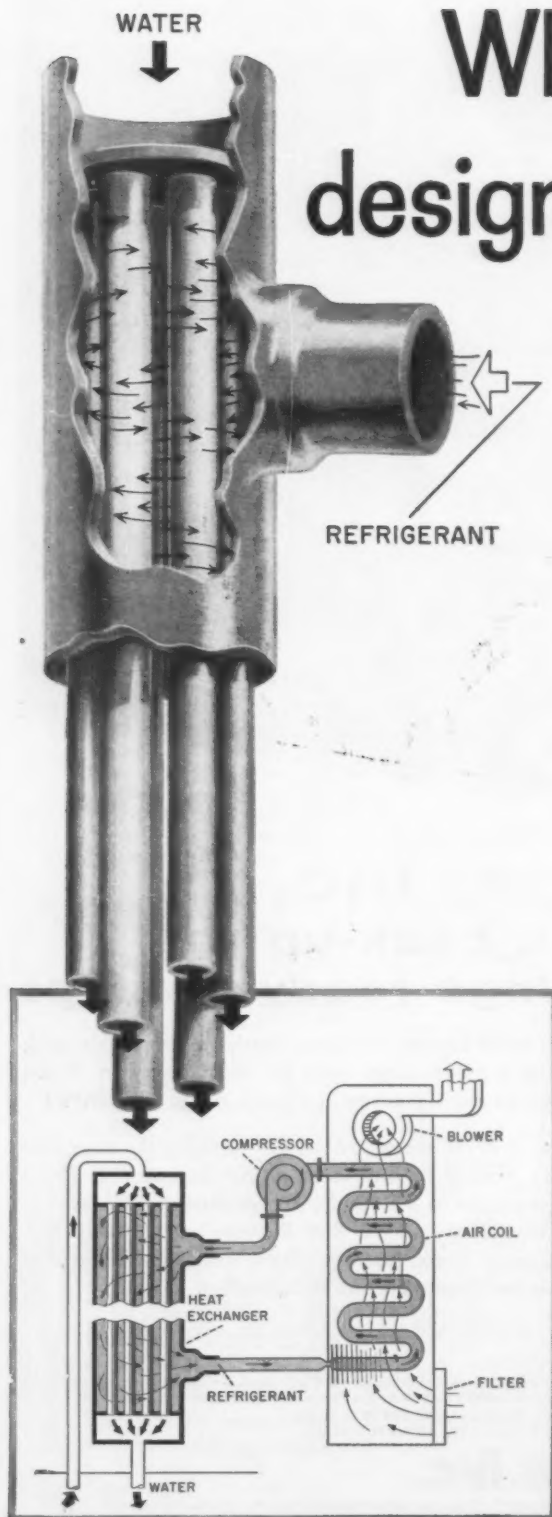
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What are today's design possibilities?



Design possibilities with the copper metals are as varied as these metals themselves. The forty-two industry standard alloys and the hundreds of special copper alloys offer combinations of electrical, thermal, chemical, structural, joining and finishing properties which are more valuable in this day of rigid performance specifications than ever before.

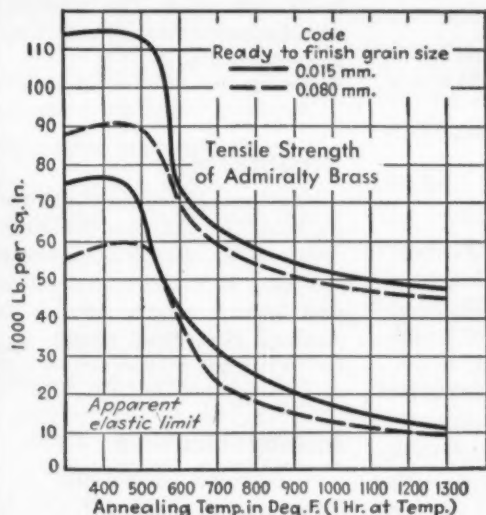
Today, most parts must meet several material requirements. Even a fastener, in addition to strength, may need corrosion resistant and high-finish properties. A supporting member may also have to conduct heat. Efficiency calls for materials versatility. And versatility calls for the copper metals. Although used since 7500 BC, copper is being re-examined as a new material with design possibilities that have scarcely been tapped. Here are some of the problems, and some of the properties that have special meaning at this time:

Design Problem — Heat pump condenser

The tube-in-tube condenser in a Typhoon Heat Pump must transfer heat between the ground water and the recirculating refrigerant. Corrosive sodium and sulphur compounds are dissolved in the ground water. The refrigerant, being highly volatile, must be confined in a leakproof system. The house air must be heated in winter and cooled in summer by passing over heat-transfer coils. The design requirements, then, include corrosion resistance, heat conductance and impermeability to the refrigerant. These requirements are met by three forms of copper. The ground water is contained in Admiralty Brass because of its excellent resistance to salt and sulphur corrosion. The refrigerant is contained in commercially-pure copper because of its density and the impermeability of its soldered joints. The air coil is a tinned copper fin soldered to a copper tube for maximum heat transfer at a realistic cost.

The good heat conductivity of copper and Admiralty Brass is, of course, important. But the conductivity of the metals themselves would be of little use if they did not also resist corrosion. The reason for this (besides durability) is because a heavy layer of corrosion products would severely reduce transfer efficiency.

TYPHOON HEAT PUMP CONDENSER SECTION (shown actual size). Heat exchange between ground water and refrigerant is accomplished in this unit. The corrosion resistance and high heat conductance of the copper metals used are vital to efficient operation. Drawing at bottom shows the complete cycles schematically.



As with any piping system, impact and tensile strengths of the groundwater tubing are also important. Slight shifts in the substrata can produce heavy stresses. Admiralty Brass, as manufactured for this tubing, develops a tensile strength of the order of 45,000 psi. Many copper alloys are even stronger. The high-zinc brasses, nickel silvers, beryllium copper, the silicon bronzes and the phosphor bronzes can be processed to provide tensile strengths of the order of 140,000 psi for hard-drawn wire. Strengths, of course, vary with temper. The graph above illustrates the range of strengths for Admiralty Brass.

Design Problem — Preheating for atomic reactor

The induction heating coils used in the Organic Moderated Reactor Experiment, a nuclear power project operated by Atomics International, a division of North American Aviation, Inc., for the Atomic Energy Commission, keep the organic moderating compound in a fluid state during reactor startup and shutdown. The necessary high temperatures are generated by eddy currents in the reactor tank. The design requirements for the coils were high electrical conductivity and good high-temperature characteristics. Oxygen-free, high-conductivity copper was the answer. Its freedom from impurities assures high conductivity and guards against high temperature oxidation and scaling.

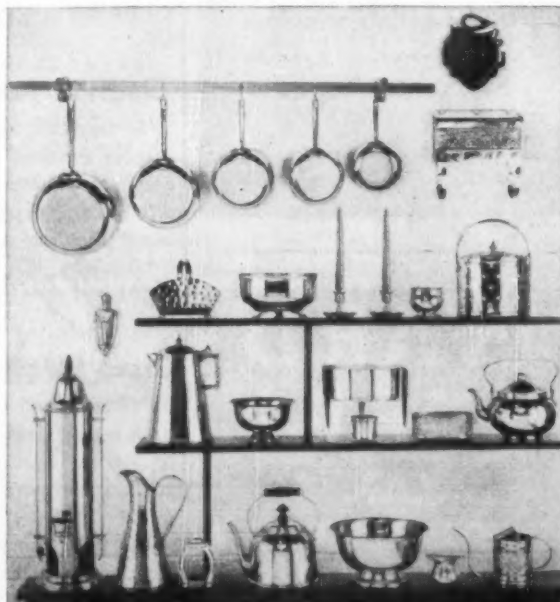
Design Problem—Yours

The combination of properties that you need for today's multifunction design requirements can probably be found among the copper metals. The copper industry will help you find it. The Copper & Brass Research Association, 420 Lexington Ave., New York 17, N. Y., will welcome your inquiry.

← **EFFECT OF ANNEALING ON TENSILE STRENGTH** and apparent elastic limit of admiralty-metal strip, previously cold-rolled 6 B. & S. Nos. (50% reduction of area) from two different grain sizes, 0.015 and 0.080 mm. (0.040-in. stock).



COPPER COILS being installed on the bottom of the main core vessel of the Organic Moderated Reactor Experiment.



FINISHING REQUIREMENTS. The nickel silvers and low-zinc brasses are widely used in ornamental applications because of their ease of plating and finishing as well as their cold-working properties. The new fine-grain brasses offer an ideal surface structure for economical high finish.

The picture above shows various combinations of coppers and brasses used decoratively in housewares.

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GREY IRON
CASTINGS

ONE OF THE
NATION'S LARGEST
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**THE WHELAND
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FREE LITERATURE

ceramics, water, sewage and industrial waste applications. (Hardinge Co., Inc.)

For free copy circle No. 10 on postcard, p. 111

Grinding Mill

A "packaged" grinding plant appearing in a new bulletin features a vibrating grinding mill. Requiring less than half the space of similar equipment, the plant is said to out-produce a mill 15 to 30 times per unit volume. Among materials it grinds are: ores, carbides, furnace slag, cement clinker, coke, fired silica refractory, and high carbon ferro-alloys. (Allis - Chalmers Mfg. Co.)

For free copy circle No. 11 on postcard, p. 111

Electric Furnace

A conveyor type, heat treating furnace covered in a bulletin is a compact production unit. It handles alloying transistors and diodes, metal bonding and soldering, and similar jobs. (C. I. Hayes, Inc.)

For free copy circle No. 12 on postcard, p. 111

Steel Heating

"Gradation" heating in steel mills is discussed in a 28-page booklet. Steel heating equipment described develops desired product quality quickly, effectively, with automated, compact setups. (Selas Corp. of America.)

For free copy circle No. 13 on postcard, p. 111

Limit Switches

Heavy-duty limit switches appear in a 16-page catalog. Switches include fast-change, compact, rugged and explosion-proof types. (Micro Switch Div., Minneapolis - Honeywell Regulator Co.)

For free copy circle No. 14 on postcard, p. 111

Dual Torque Hoist

A 4-page folder presents a new hoisting concept. It tells how one hook, one trolley hoist and one set

of electrical controls offer dual capacity and speed. This eliminates need for another unit. (Pacific Coast Engineering Co.)

For free copy circle No. 15 on postcard, p. 111

Structurals

New load-bearing punched channel studs, rigid frames, acoustical ceiling deck and wide rim deck are now part of a firm's architectural steel line. A catalog reviews the products. (Stran-Steel Corp.)

For free copy circle No. 16 on postcard, p. 111

Miniaturization

A brochure outlines the 1958 Miniaturization Award. It lists criteria, provides an entry form, and gives other data on the award. (Miniaturization Award Committee.)

For free copy circle No. 17 on postcard, p. 111

Plant Sites

Washington State offers manufacturers many advantages for new plant location. A 4-page folder tells how the Western U. S. is growing in general and the Puget Sound area in particular. (Puget Sound Power & Light Co.)

For free copy circle No. 18 on postcard, p. 111

Machinability

"Gray iron castings," a dozen-page brochure points out, possess "machinability right down the line." Besides general information of gray iron, it presents a foundry's facilities for quality production job work. (Gartland Foundry Co.)

For free copy circle No. 19 on postcard, p. 111

Tape-run Drills

Tape-run and hydraulic-operated turret drills are presented in a 12-page bulletin. It illustrates 6 and 8-spindle automatic models. Machines feature pre-select speed changes, depth control, and feed rate, for each spindle. Drilling and tapping capacities: $\frac{3}{4}$ and $1\frac{1}{2}$ -in. diam in steel. (Burg Tool Mfg. Co.)

For free copy circle No. 20 on postcard, p. 111

FREE LITERATURE

Continued

These publications describe money-saving equipment and services . . . they are free with no obligation . . . just circle the number and mail the postcard.

Steel Joists

Open-web steel joists detailed in a 36-page manual aid construction of lightweight, economical, safe floor and roof systems. (Ceco Steel Products Corp.)

For free copy circle No. 21 on postcard

Crane Electrification

Aluminum inverted-Y conductor systems are explained in an 8-page booklet. It covers crane and runway electrification for general industrial usage requiring currents of 500 to 1200 amp. (Cleveland Crane & Engineering Co.)

For free copy circle No. 22 on postcard

Power Tools

A newly revised 88-page catalog describes "the world's most complete line" of industrial power tools and accessories. (Delta Power Tool Div.)

For free copy circle No. 23 on postcard

Data Handling

Electronic data handling systems are examined in a bulletin. It describes "a new concept" in industrial logging, monitoring, and integration of process information. (Kybernetes Div., Hagan Chemicals & Controls, Inc.)

For free copy circle No. 24 on postcard

Aerosol Sprays

The history of aerosol spray products is reviewed in a booklet. In particular, it deals with industrial applications. The 16-page booklet discusses aerosol sprays of: rust inhibitor, clear-coating plastic, tool-maker's ink and cleaning oil, lubricating oil, heavy-duty wire rope

lube, multi-purpose grease, heavy-duty open gear grease, color code paint, maintenance and touchup paint, bench fire extinguisher and zinc chromate primer. (Crown Industrial Products Co.)

For free copy circle No. 25 on postcard

Lathe

A 15-in. Lathe described in a circular fills a gap between geared head and belt-driven lathes. (Sheldon Machine Co., Inc.)

For free copy circle No. 26 on postcard

Slotted Angle

A 12-page booklet gives assembly data for forming slotted angle into a wide range of structures. (Acme Steel Co.)

For free copy circle No. 27 on postcard

Barrel Finishing

Multiple compartment, barrel finishing machines are illustrated in a bulletin. (Wheelabrator Corp.)

For free copy circle No. 28 on postcard

3-D Designing

Called "Designing in 3-D," a catalog contains data on thousands of parts and materials for building industrial scale models. (Scott Industries, Inc.)

For free copy circle No. 29 on postcard

Tube, Pipe, Fittings

Various types of carbon, alloy and stainless steel tubing, pipe, seamless welding fittings and flanges are listed in a 4-page folder. It's a cross reference between steel type, use and product specifications. ASTM specifications are included. (Tubular Products Div., Babcock & Wilcox Co.)

For free copy circle No. 30 on postcard

Thermocouples

Described in a data catalog are thermocouples for users in the nuclear, aircraft, industrial and process fields. Temperature range of these thermocouples runs from 400° to 2000°F; diameters are 0.025 to 0.313 in. They can be bent to shapes. Weldments can be

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FREE LITERATURE

performed directly on thermocouples. They're pressure tight to 50,000 psig. (Aero Research Instrument Co.)

For free copy circle No. 31 on postcard

All-weather Motors

A 6-page bulletin covers new horizontal weather protected motors. Ratings run from 250 to 2000 HP. (Louis Allis Co.)

For free copy circle No. 32 on postcard

Machines

In its 88 pages a catalog lists such diverse equipment as: precision boring machines, custom and transfer machines, precision thread grinders, miscellaneous grinding equipment, jet blade profiling and finishing machines, vertical contouring machines and vertical boring machines. (For free copy write on company letterhead to Ex-Cell-O Corp., 1200 Oakman Blvd., Detroit 32, Mich.)

Automatic Feeders

Automatic parts feeders are described in a brochure. Covered are: non-mar feeder-orientors for handling fragile and highly finished parts, elevating oriented feed hoppers, stack feeders and rotary hoppers. (Industrial Automation Equipment Section, Radio Corp. of America.)

For free copy circle No. 33 on postcard

Roller Bearings

Spherical roller bearings are subjects of a comprehensive catalog. It covers five standard series of self-aligning bearings. Bore sizes range from 40 to 1060 mm. (For free copy write on company letterhead to Torrington Co., Bantam Bearings Div., South Bend 21, Ind.)

Metals and Castings

A 6-page folder reviews a firm's electric furnace alloy and carbon steel castings. It details a line of standard and special steel castings. A second folder, four pages, outlines: chemical analyses, physical

properties, and comparable specifications (ASTM, Federal, AAR, Military, SAE) of production cast steels. (Farrell-Cheek Steel Co.)

For free copy circle No. 35 on postcard

Control Rods

If you have linkage problems you may be interested in a new control rod assembly. A 125,000-pai tensile-strength welding rod is employed to weld the two end rings to the control rod. A hardened and precision ground spherical race retains the self-aligning balls; this assures long cycling life at either high or low velocity. A bulletin gives details. It states that the producer doesn't "expect or intend this type will replace our standard line of rod ends." (Carter Engineering Co.)

For free copy circle No. 36 on postcard

Motors

Synchronous motors and controls are shown in a 27-page brochure. It contains motor selector charts, application data, and formulas for calculating power factor. (Westinghouse Electric Corp.)

For free copy circle No. 37 on postcard

Woven Wire Belt

Woven wire processing belts are reported on in a 4-page bulletin. Key features include: factors to consider in selecting metal conveyor belts, and ideas for boosting operating efficiency and belt life. (Colorado Fuel & Iron Corp.)

For free copy circle No. 38 on postcard

Carbon, Graphite

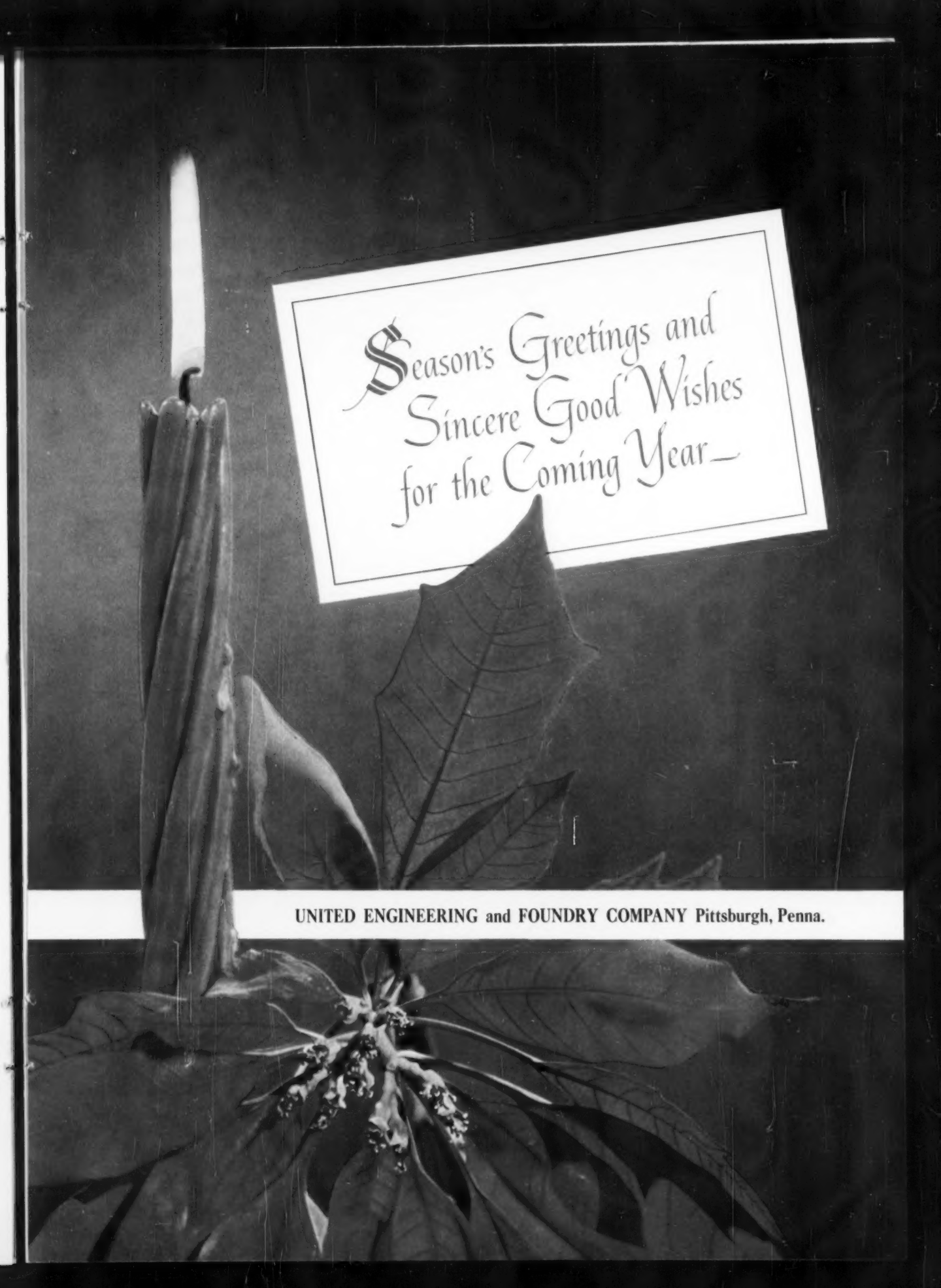
A 56-page manual gives data on a wide range of carbon and graphite products. It discusses a number of mechanical, chemical, electrical and refractory uses. (Stackpole Carbon Co.)

For free copy circle No. 39 on postcard

Tubing, Pipe

Special purpose alloys for welded tubing and pipe listed in a bulletin have use especially in aircraft, missile, nuclear energy and chemical fields. The booklet covers: sizes, gages, finishes, chemical composition. (Carpenter Steel Co.)

For free copy circle No. 40 on postcard

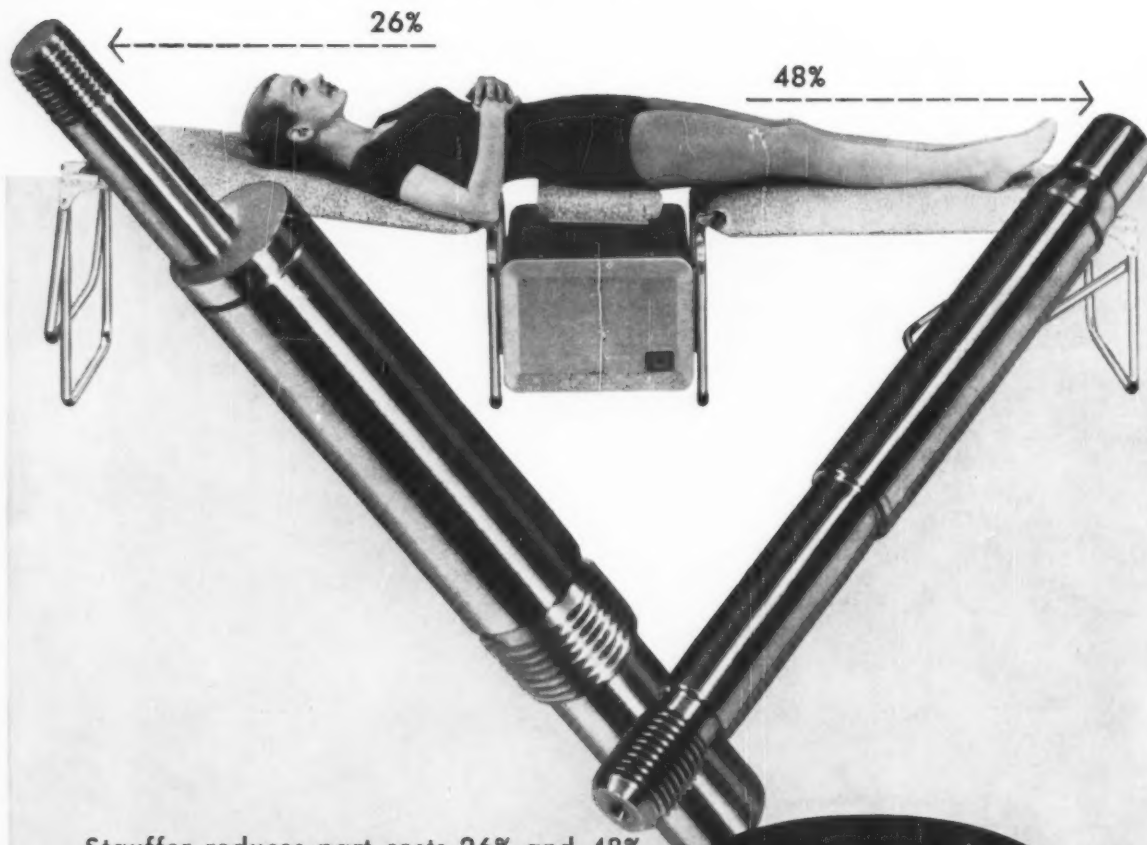


*Season's Greetings and
Sincere Good Wishes
for the Coming Year—*

UNITED ENGINEERING and FOUNDRY COMPANY Pittsburgh, Penna.

SHE is improving her figure on a Stauffer "Magic Couch." And although she doesn't know it, Stauffer makes two of the Magic Couch's most important operating parts from LaSalle ground and polished STRESSPROOF® steel bars. This means that her Magic Couch will last longer, will be more dependable.

Stauffer reduces cost figures, too!



Stauffer reduces part costs 26% and 48%
by using today's improved ground
and polished...

STRESSPROOF®
STEEL BARS

WITH COPPER

ELIMINATES Heat Treating

This eccentric shaft . . . and this idler shaft, two of the most important parts of Stauffer's Magic Couch, were formerly made of heat treated C-1137. But Stauffer design engineers recommended a change to LaSalle ground and polished STRESSPROOF® steel bars . . . with copper.

The result: no need for rough grinding . . . no need for expensive heat treating. Production costs were reduced 26% on the eccentric shaft . . . 48% on the idler shaft.

Today's improved ground and polished STRESSPROOF® can help your per-part cost. It gives high strength without heat treating . . . it machines 50% to 100% faster than heat treated alloys . . . it minimizes warpage . . . it makes a better part at a lower cost.

To find out how STRESSPROOF® can help you, just write for a copy of the newly published bulletin, "Today's Improved LaSalle Stressproof Steel Bars . . . with copper." Or for production applications, ask for a sample bar for test purposes.



LaSalle STEEL COMPANY

1436 150th Street, Hammond, Indiana

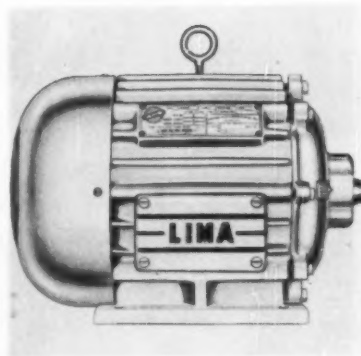
New Materials and Components

Motor Frame Fins Rapidly Dissipate Heat

Frames of new explosion-proof motors contain deep, integrally cast fins; these provide extra cooling surface for rapid heat dissipation. Underwriters' Laboratories approved for Class I Group D and Class II Groups F and G service, the motors come in new NEMA standard frames Numbers 182 through 326U. These new NEMA frame assignments accommodate standard rat-

ings of 1 through 40 hp, either 3 or 2 phase, in all commercial frequencies and voltages below 600. The motors are approved for use where hazardous gases or vapors are present. Motor design eliminates all corners, pockets and air passages which could clog and retard cooling and motor efficiency. (Lima Electric Motor Co., Inc.)

For more data circle No. 41 on postcard, p. 111

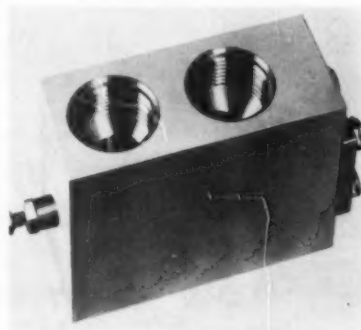


Control Valves Offer Quick, Safe Response

Only low mechanical force is necessary to unload this controllable check valve. Combining dependability and precision, it serves control systems where safe, fast, easy response is required. The spring loaded valve permits free flow in one direction and checks reverse flow until it is unloaded by depressing an external plunger. The valve

requires 100-lb maximum pressure to unload with 3000 psi on the checked flow part. With a 25-gpm flow at 3000-psi, pressure drop is 65-psi maximum in the free flow direction and 35-psi maximum in the checked flow position. Weight: 3¼ lb. Proof pressure: 4500 psi. Burst pressure: 7500 psi. (Fluid Regulators Corp.)

For more data circle No. 42 on postcard, p. 111

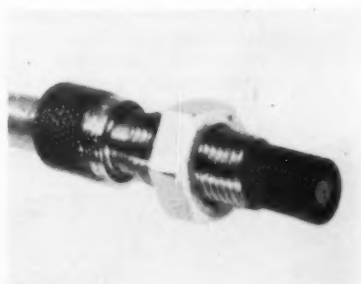


Tiny Proximity Pickup Works While Submerged

A new type miniature proximity pickup works while submerged. It also has uses on machines using coating oils or coolants. Its sensing face is 5/16-in. diam. Over-all length is 1 21/32 in. Mounting thread is 3/8-24. Two models are available. Both have a 10-ft cable potted in place for complete water

and oil resistance. Small size adapts them to use in extremely confined spaces. They detect both ferrous and non-ferrous metal parts having a diameter of less than 1/10 in. They can be excited by gear teeth of 10 diametral pitch. (Electro Products Laboratories.)

For more data circle No. 43 on postcard, p. 111

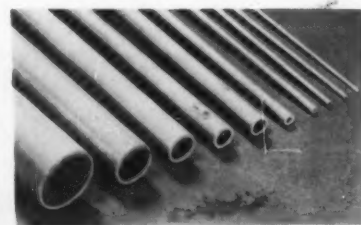


Beryllium-copper Tube Serves Electrical Uses

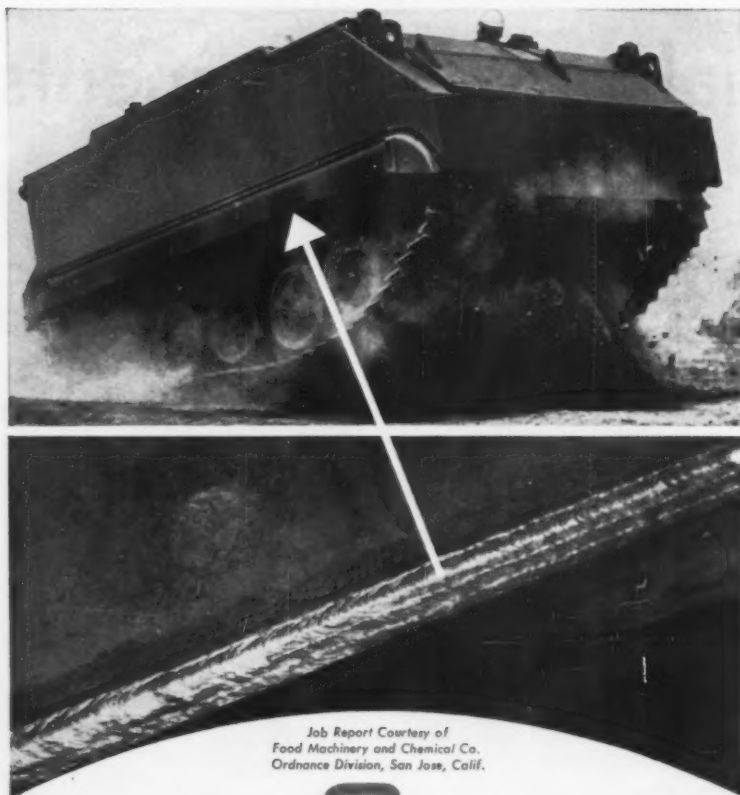
A complete line of seamless beryllium copper tubing comes in sizes from 0.10-in. OD to 0.625-in. OD. Wall thicknesses range from 0.042 to 0.001-in. This No. 25 alloy finds use in instrument, ap-

pliance, and electrical and electronic component design. It has excellent spring characteristics, tensile strength, high electrical conductivity and good forming properties. (Uniform Tubes, Inc.)

For more data circle No. 44 on postcard, p. 114



How to produce low alloy welds to resist tons of torture



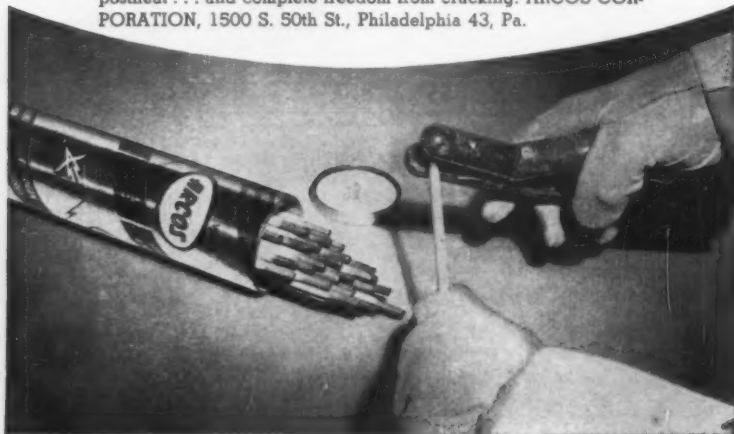
*Job Report Courtesy of
Food Machinery and Chemical Co.
Ordnance Division, San Jose, Calif.*

WELD WITH

ARCOS 

LOW ALLOY ELECTRODES

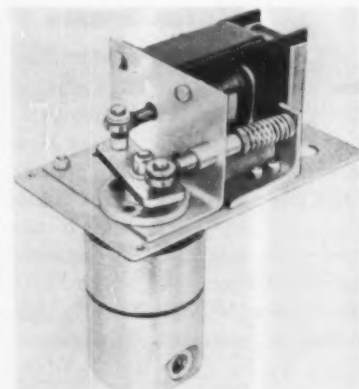
This 22½ ton armored personnel carrier proves an important point. When working with hard-to-weld low-alloy plate, and welds must be extra strong and tough in the "as welded" condition, it pays to use the highest quality weld metal available. In this case, Arcos Tensilend 100, a low hydrogen coated electrode produced weld metal that matched the physical and chemical properties of the base metal. In addition, it did the job with less nickel than the 19-9 modified electrode formerly used. There was no preheat, no postheat . . . and complete freedom from cracking. ARCOS CORPORATION, 1500 S. 50th St., Philadelphia 43, Pa.



DESIGN DIGEST

Solenoid Valves

Standard cataloged 10,000-psi valves are now available for immediate delivery. Shutoff and four-way valves come in ¼, ⅜ and ½-in. port sizes. Ratings are 10,000-psi liquid or gases. They with-



stand 15,000-psi surges without damage to sealing qualities. Burst pressure is 30,000 psi. Solenoids are available for 115, 230 and 460-v ac operation. (Barksdale Valves).

For more data circle No. 45 on postcard, p. 111

Electric Eyes

Sub-miniature light sources and photounits are only ⅞-in. long, over-all. They are designed especially for use with a company's regular control relay and others which provide modulation of both light strength and photounit sensitivity. Units feature exceedingly precise triggering of light differences both by transmitted or reflected light. (ESS Instrument Co.)

For more data circle No. 46 on postcard, p. 111

Dispersions

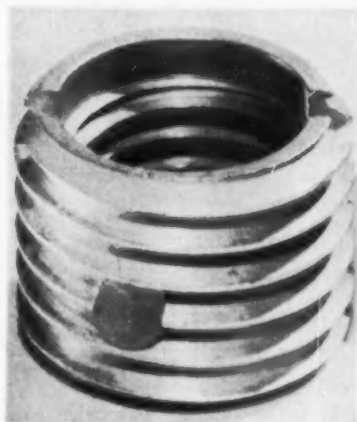
Dispersions of Teflon resins, in a selection of binders, are now available for application to heat-sensitive surfaces. So far there are two such colloidal dispersions on the market. Advantages of the materials include: low coefficient of friction, flexibility, chemical inertness, less than 0.01 moisture absorption and excellent durability. In addition, resins can withstand -450° to +500°F. Cur-

ing is possible at 300°F or even less. Thus a lubricating, corrosion resistant film can apply to light metal, wood, rubber, plastics, and many other heat-sensitive materials. (Acheson Colloids Co.)

For more data circle No. 47 on postcard, p. 111

Threaded Insert

Self locking, threaded inserts now available require only standard coarse thread taps and a standard bolt or screw driver for installation. Other characteristics of the new insert are: (1) simple removal by screw driver; (2) re-use, any number of times; (3) 100 pct resistance to vibration, due to self-locking



nylon pellet design. When compressed, the resilient nylon pellet sets up a counterforce. This creates a strong metal-to-metal engagement of threads opposite the nylon pellet. Inserts display extreme resistance to heat, cold, moisture, solvents, and aging. (Tool Components, Inc.)

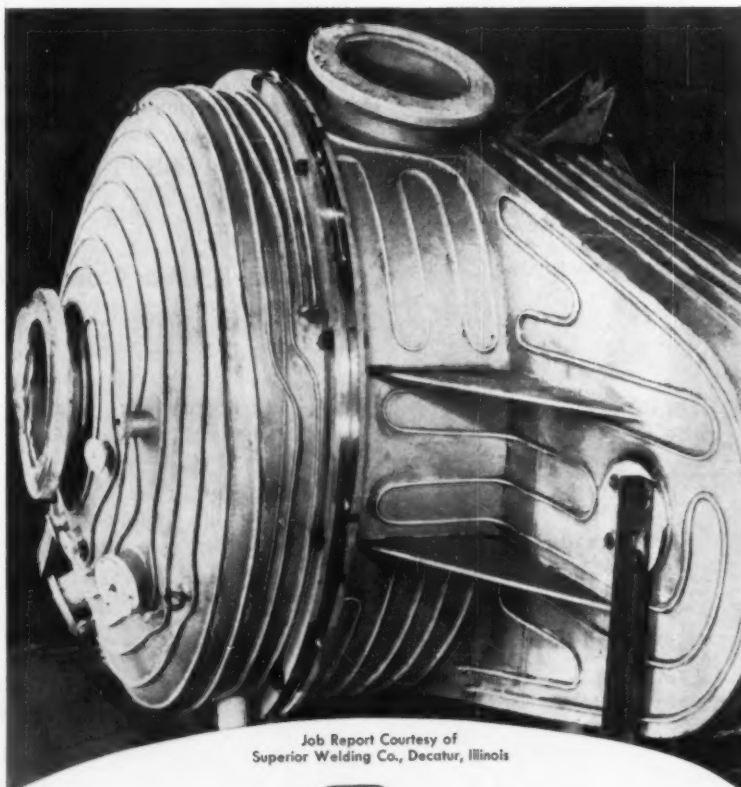
For more data circle No. 48 on postcard, p. 111

Magnetic Alloys

Two new magnetic alloys have high permeabilities, particularly at low inductions. One, a nickel-molybdenum-iron alloy, provides minimum 60-cycle ac permeability of 35,000 at 40 gauss for 0.014-in. thick strip. The second, a vacuum-melted nickel-molybdenum-iron alloy, has a minimum permeability of 55,000 at 40 gauss. (Carpenter Steel Co.)

For more data circle No. 49 on postcard, p. 111

When stainless welds must be VACUUM TIGHT



Job Report Courtesy of
Superior Welding Co., Decatur, Illinois

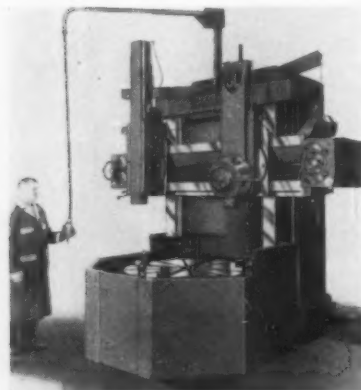
WELD WITH **ARCOS** 
STAINLESS ELECTRODES

Shown here is a stainless steel furnace body of type 304 ELC for use under very high vacuum conditions in the casting of metals where exceptional purity is required. Arcos Chromend K-LC Stainless Electrodes were used because Arcos electrodes not only assured the proper weld metal chemistry, but also the necessary soundness to insure vacuum tight welds. Save money and future problems with long-lasting Arcos-produced welds. ARCOS CORPORATION, 1500 S. 50th Street, Philadelphia 43, Pa.



New Production Ideas

Equipment, Methods and Services

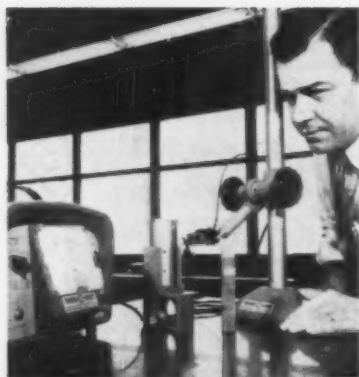


Vertical Lathe Conserves Floor Space

All-electric, this 52-in. vertical turret lathe is compact, taking one-third less floor space than similar capacity machine tools. Its design suits the lathe to high speed machining with carbides and ceramics. Though it's small in size, the lathe maintains a full-depth, box-shaped column behind the ram and rail heads. It applies a new idea in machine tool power transmission. Instead of using many separate shafts

and sliding gears, all 32 speeds in two ranges come from a coaxial, planetary transmission. This fits into a small space in the housing. All four planetary gear sets have a common axis. Gear combinations are "linked" through the control circuit by energizing different series of electric clutches. This permits the gears to be in constant mesh. (Giddings & Lewis Machine Tool Co.)

For more data circle No. 50 on postcard, p. 111



Gages Have Completely Transistorized Circuits

Measuring gages just introduced feature completely transistorized circuits and four separate magnifications. These can instantly be selected by flicking a switch. Gages measure optionally in thousandths, ten-thousandths or millionths. Compact, lightweight and portable, the instruments combine shop ruggedness with lab accuracy. Reading accuracy is not affected by normal voltage and frequency fluctuations. Re-

sponse is instant; there's no time lag between gage contact and meter reading. The gaging circuit operates at 5000 cps. This high rate permits considerable miniaturization of several components. Thus, gaging pressure is less than 1 oz; it won't distort extremely small, delicate workpieces or mar finished surfaces. (Pratt & Whitney Co.)

For more data circle No. 51 on postcard, p. 111



Machines Eliminate Noises From Gearing

Simple, fast, universal machines are now available which eliminate common causes of noise in spiral bevel gearing, including hypoid and Zerol type gears. The machines do away with: (1) nicks on the outside diameter of the pinion caused during handling in the green state; (2) saw-tooth edges along the face angle of the pinion teeth caused by feed marks from turning the gear blank, and gear cutting; and (3) pressure concentration on one end or the other of ring gear teeth caused by

cutting errors or heat treat distortion. The machines include a grinder and a tooth "topping" unit. The first relieves heel and toe ends of hardened gear teeth to eliminate stress concentration. The tooth "topping" machine (pictured here) removes nicks and saw tooth edges from the pinion teeth before they go into heat-treat. Grinder and tooth "topping" machines both have the same dual safety start button feature. In both, the rocking table automatically returns to loading po-

sition when the cycle is completed. (Modern Industrial Engineering Co.)

For more data circle No. 52 on postcard, p. 111

Respirator Filter

This variable density respirator filter has Bureau of Mines approval for respiratory protection against all dusts not significantly more toxic than lead. It also protects the wearer from pneumoconiosis-producing and nuisance mists and chromic acid mist. The filter consists of two sections: (1) a red prefilter and, (2) the filter body. The built-in prefilter contains interlocked viscose fibers.



It's thermally bonded to the filter body. This prefilter traps larger sized airborne particles, agglomerates of smaller particles and a reasonable amount of microscopic particles. A relatively open structure results in a large storage capacity for retained particles. The grey filter body consists of a special combination of microfine viscose and vinyon fibers and ultrafine asbestos fibers. (American Optical Co.)

For more data circle No. 53 on postcard, p. 111

Positioning Table

A large size automatic positioning table is tape controlled. The 2-axis, point-to-point table has a 16 x 24-in. working surface and 14 x 18-in. travel. It's completely self-contained, consisting of the table and control console. The latter includes all programming and playback controls. The unit can work with any existing vertical spindle machine tool. It re-

quires no modification of the machine with which it works. (Industrial Controls Div., Topp Industries, Inc.)

For more data circle No. 54 on postcard, p. 111

Tracing Lathe

Ruggedly built, a new tracer lathe meets a wide range of turning requirements. It accommodates one of two tracing units. One performs a single tracing cut in a fully

automatic cycle; the other unit provides two fully automatic tracing cuts with an indexing tool holder. Both units allow feed change during cut. Specifications are: 23-in. diam swing over rails; 13½-in. diam swing over tracer slide. Work diameter can range from ½-in. minimum to 8-in. maximum. Maximum length of work between centers can be 24, 48 or 72 in. (Jones & Lamson Machine Co.)

For more data circle No. 55 on postcard, p. 111



ABELL-HOWE

**UNDERHUNG
CRANES**

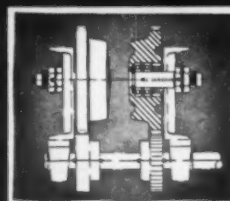
now with

FORGED ALLOY STEEL WHEELS, GEARS and PINIONS

Only Abell-Howe offers you forged steel dependability at all critical points of wear—wheels, gears and pinions! Furthermore, Abell-Howe rugged outrigger construction keeps bridge in square—provides lateral bracing for bridge girder. Smooth fluid drive provides cushioned starts whatever the load—reduces reversing shocks. To further assure smooth operation and lasting service, anti-friction bearings used throughout—with double row ball bearings in end truck wheels. Here's crane value that can't be beat!

**ABELL-HOWE
COMPANY**

7765 W. Van Buren St., Forest Park, Illinois



another ABELL-HOWE plus "QUICKLOCK" WHEEL ASSEMBLIES

Combine positive wheel mounting with immediate removability. To remove axle, simply loosen two nuts, twist axle 90° and pull it out. Wheels, too, are as easily removed with no dismantling of truck frame. "QUICKLOCK" is exclusive with Abell-Howe.

Ask for
BULLETIN





How to avoid alloy steel failures

Ordinary precautions may protect you most of the time. But your luck could run out—and a single alloy steel failure can result in serious loss.

That's why the *extra* precautions of the Ryerson Certified Alloy Steel Plan are important to you. Under this plan you know three vital facts about the alloy steel you order from Ryerson stock:

- **Heat identification** . . . not just type identification, but the positive identification of your particular heat of alloy which has been spark-tested and separately racked to eliminate the possibility of mixed steels.
- **Chemical analysis** . . . not just the chemical range for the type, but the specific analysis of the heat from which your steel was rolled—keyed to your steel's identification.
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The Iron Age Summary

Steel Pickup Gaining Strength

Market upturn will gain momentum after the turn of the year.

Factors include inventory rebuilding, fatter order books, strengthening demand from the auto industry, and forecasts of an improved economy.

■ The upturn in steel demand is gaining speed. The big push will really get underway after the turn of the year.

Here are the market developments behind this forecast:

(1) **Steel users are rebuilding inventories.** This buildup is now barely underway. It will develop a full head of steam in the first and second quarters of 1959.

(2) **Steel order backlogs are mounting.** Shipments also are increasing, but incoming orders are such that most mills will enter the new year with healthy order books. One mill reports its backlogs are up 23 pct over a month ago.

(3) **Demand from the auto industry is good, and improving.**

Some auto firms already have made plans to step up their supplies over the next three months and have passed the word along to the mills.

(4) **Demand from stampers and forgers also is improving.** Appliance makers are taking in more steel. Demand for linepipe and oil country casing and tubing could catch fire at any time in the first half of '59.

(5) **Consistently optimistic forecasts** that '59 will be a better year economically than '58 have prompted both big and small steel users to order farther ahead and build up their inventories.

Some other straws in the wind:

Industry Use Is Up — While there are still many users who are ordering 30 to 60 days ahead, more and more are looking 90 days ahead.

Industry is chewing up more steel due to better manufacturers' orders. This means that users will have to order that much more steel if they are going to rebuild inventories.

Detroit Confident — Plates and structurals are showing signs of a pickup. Up to now, the market strength has been based largely on sheets and bars. But in the Midwest, notably Chicago, plate and structural demand has been improving. This trend will spread to other areas.

Last week and this week the flow of orders from automakers suggests a conviction that this will be a good model year. At least one large carmaker has started to lay in stock now, and is planning orderly shipments from here on out.

Capacity Will Be Up—One thing to keep in mind: The improved steel market may be obscured at the start of '59 due to the official increase in steelmaking capacity. New capacity as of Jan. 1 is expected to be about 146 million ingot tons, compared with the current 141 million tons.

On this basis the mills could be turning out as many tons or more on Jan. 1 than they were on Dec. 31 but the steel ingot rate might drop due to the increase in capacity.

Steel Output, Operating Rates

Production	This Week	Last Week	Month Ago	Year Ago
(Net tons, 000 omitted)	2,025	1,985	2,025	1,741
Ingot Index				
[1947-1949=100]	126.1	123.6	125.1	108.4
Operating Rates				
Chicago	86.0	85.0	87.0	71.0
Pittsburgh	71.5	70.0*	69.0	63.0
Philadelphia	73.5	73.0*	73.0	74.0
Valley	57.5	53.5*	55.5	56.0
West	85.0	84.0	82.0	80.0
Cleveland	75.0	69.5*	70.0	68.0
Buffalo	66.0	66.0	78.0	63.5
Detroit	87.0	93.0*	95.0	81.0
South	67.0	65.0	58.0	71.0
South Ohio River	83.0	79.0*	81.0	70.0
Upper Ohio River	87.0	86.5*	88.0	63.0
St. Louis	93.0	77.0*	98.0	76.0
Aggregate	75.0	73.5*	74.5	68.0

*Revised

Prices At a Glance

	This Week	Week Ago	Month Ago	Year Ago
(Cents per lb unless otherwise noted)				
Composite price				
Finished Steel, base	6.196	6.196	6.196	5.967
Pig Iron (gross ton)	\$66.41	\$66.41	\$66.41	\$66.42
Scrap No. 1 hvy (Gross ton)	\$39.83	\$39.83	\$41.17	\$32.00
No. 2 bundles	\$29.00	\$28.17	\$29.33	\$24.00
Nonferrous				
Aluminum ingot	26.80	26.80	26.80	28.10
Copper, electrolytic	29.00	29.00	29.00	27.00
Lead, St. Louis	12.80	12.80	12.80	12.80
Magnesium	36.00	36.00	36.00	36.00
Nickel, electrolytic	74.00	74.00	74.00	74.00
Tin, Straits, N. Y.	99.125	99.375	99.25	93.625
Zinc, E. St. Louis	11.50	11.50	11.50	10.00

How Data Processing Aids Buying

Inventory control is quickly, accurately handled at Perfection Gear Co. with punched card data processing machines.

The system provides full information on every item held in stock.

■ Does data processing equipment pay its way in a purchasing operation? Seymour Ellison, Chicago chapter NAPA president, and purchasing agent for Perfection Gear Co., believes it does.

Mr. Ellison, with an assistant, a stenographer, and two clerks, is charged with purchasing operations that serve: (1) a manufacturing plant, (2) stocks for 35 warehouses, and (3) supply stock for a jobber-distributor organization numbering 2500 firms.

Centralized Control—Inventory tabulation for the entire system is handled with punched-card data processing machines. Perfection Gear is a veteran in use of data processing. The firm began using punched card equipment over 20 years ago. Production programming, payroll, and inventory control are all handled by the same data processing center.

At Perfection Gear, inventory data is run once each month. When stocks of any item drop below the order point, the data processing machines record a reorder signal for that part. The machines also indicate whether the part was signalled for reorder the previous month with no action taken, whether the part is obsolete, and whether it is a purchased part or an assembled item.

Inventory Check—With this information, plus his own continuing check on lead items for delivery from vendors, Mr. Ellison determines what amount must be purchased, balancing lead items against the amount of the deficit of the item in inventory.

As set up by Perfection's purchasing and data processing department, the machine data gives a quick, concise picture of inventory. Each part in stock is identified by number. The monthly "inventory status report" shows stocks at the beginning of the month, shipments during the month, and stocks on hand at the close of the month.

In addition, it tells the P. A. at a glance how much of each item in stock is required to fill customer orders already received by the sales department. In an adjoining column is the amount ordered from vendors but not yet received in inventory. Mr. Ellison's purchasing operation has been given top efficiency ratings by outsiders. The key to its success is the availability of full data on the status of every item in inventory.

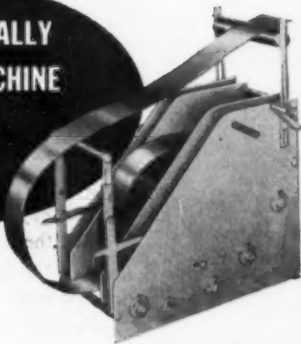
Quantity Discounts Studied—Another time-saving tip from the Perfection Gear operations: Know your vendors' quantity discounts for a number of quantities. Code this, so it can be balanced quickly against your EOQ limit. Perfection uses a form which covers standard quantities of any vendor-produced part. This compares the quantity price and number of months' supply this represents against unit price.

Savings for larger quantity buying are then balanced against monthly inventory carrying costs.



EFFICIENT OPERATION: Top ratings have been given the thorough, centralized purchasing system directed for Perfection Gear Co. by Seymour Ellison (left), the company's purchasing agent.

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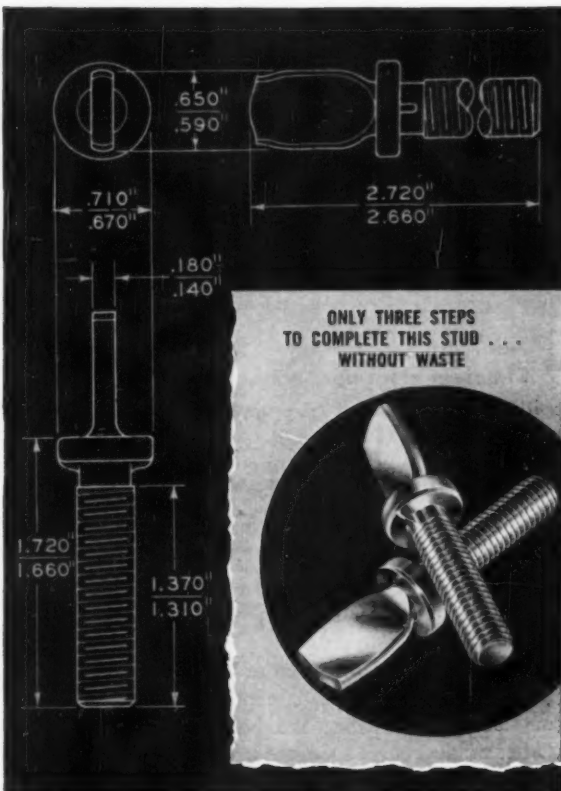
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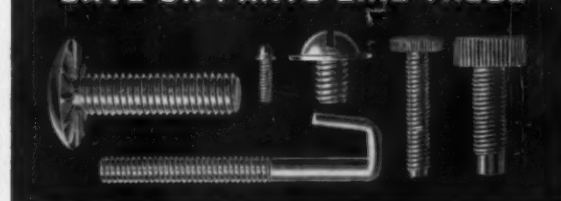
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Crucible Raises Stainless Prices

Stainless steel bar, wire, and billet prices are up an average of 3.75 pct.

Competition expected to hold the line on stainless sheet, strip, and plate.

■ Prices of some stainless steel products have gone up.

Crucible Steel Co. took the lead last week in advancing base prices of stainless bar, wire, and billets. Other producers are expected to follow suit. The new prices represent an increase of 3.75 pct.

The price of stainless plate, sheet, and cold-rolled strip is expected to hold steady. Here's why:

Base prices of stainless steels were not advanced last August when carbon steel prices went up. Increases had been expected for products like bar, wire, and billets. These are rolled largely to customer requirements on specialty mills. As a result their cost was more affected by the labor wage increases of last July.

However, pricing in other products—sheet, strip, and plate—has remained tightly competitive. Stainless sheet, for example, is sold about 65 pct through distributors and warehouses. Pricing at the jobber level is weaker than it has been for years.

Prices have been firmer for cold-rolled strip which is usually sold directly by stainless producers. But this product is in competition with aluminum for automotive applications. This could bar any immediate price hikes.

Stainless plate pricing is in a

"chaotic state," according to one steel man. The base price of plate was reduced in September. So far this year plate quantity extras have been changed twice. Jobber discounts were first eliminated, then partially restored.

Sheet and Strip—East Coast and Pittsburgh mills say customers are still ordering cautiously on a short-range basis. January orders for these producers are shaping up well. But there are, as yet, no signs of a new order upsurge. **Cleveland** area mills report automakers are starting an inventory build-up on sheet. In general, customers now allow 45 days lead time in placing orders. This is a marked change from the 20 days notice traditional through the Summer and Fall.

At **Chicago**, sheet mills are rolling semi-finished steel in expectation of heavy ordering through the first quarter. Sheet buyers there are also boosting lead times up to 45-60 days. Some users are moving February and March orders up to January.

Plate—Renewed interest in line-

PURCHASING AGENT'S CHECKLIST

Linepipe orders will improve following Supreme Court overturn of Memphis ruling. **P. 51**

Computers prove themselves in use on engineering jobs. **P. 52**

Shortages of structurals are a thing of the past, say steel producers. **P. 54**

pipe following overturn of the Memphis decision should help plate demand. **Eastern** and **Pittsburgh** mills can still offer sheared mill plate in a matter of weeks. However, **Chicago** producers say a first quarter upswing in plate is continuing. Customers there can get delivery in as little as five weeks. But they are still hitting a hot pace in placing orders. Helping the **Chicago** plate market are these factors: New linepipe orders, new orders for railroad cars, and more tank fabricating.

Bar—Auto forging suppliers have now worked off most of the bar carryover they built up during the auto strikes. They are now ordering bars against the new work they are getting. Some are even buying a couple of months in advance to build up stocks. Cold finished bars are showing renewed strength in the **Chicago** market. Bar producers report gains as high as 25 pct a month. Consumers such as fastener makers, appliance firms, farm implement makers, and construction equipment builders are doing a good share of the buying.

Linepipe — Linepipe mills are limping out of a year that never was as bad as it might have been. Shipments of large diameter pipe in 1958 will probably only be about 25 pct below 1957 levels. And, looking ahead, firm orders now on the books assure a sharp production increase in the first quarter. The favorable ruling of the Supreme Court in the Memphis case (see p. 51) makes the long backlog at the mills look even more solid.

Ryerson in Texas — Joseph T. Ryerson and Son, Inc., steel distributing subsidiary of Inland Steel Co., has entered Texas for the first time. Ryerson has acquired the Dallas and Houston plants and stocks of Vinson Steel and Aluminum Co., large steel and aluminum distributor in that area. By adding the Vinson properties, Ryerson — the nation's largest steel distributor — now has steel service centers in twenty major industrial areas.

COMPARISON OF PRICES

(Effective Dec. 16, 1958)

Steel prices on this page are the average of various f.o.b. quotations of major producing areas: Pittsburgh, Chicago, Gary, Cleveland, Youngstown.
Price advances over previous week are printed in Heavy Type: declines appear in *Italics*.

	Dec. 16 1958	Dec. 9 1958	Nov. 18 1958	Dec. 17 1957
Flat-Rolled Steel: (per pound)				
Hot-rolled sheets	5.10¢	5.10¢	5.10¢	4.925¢
Cold-rolled sheets	6.275	6.275	6.275	6.05
Galvanized sheets (10 ga.)	6.875	6.875	6.875	6.60
Hot-rolled strip	5.10	5.10	5.10	4.925
Cold-rolled strip	7.425	7.425	7.425	7.17
Plate	5.30	5.30	5.30*	5.12
Plates, wrought iron	13.55	13.55	13.55	13.15
Stain's C-R strip (No. 302)	52.00	52.00	52.00	52.00
Tin and Terneplate: (per base box)				
Tinplate (1.50 lb.) cokes	\$10.65	\$10.65	\$10.65	\$10.30
Tin plates, electro (0.50 lb.)	9.35	9.35	9.35	9.00
Special coated mfg. ternes	9.90	9.90	9.90	9.55
Bars and Shapes: (per pound)				
Merchant bar	5.675¢	5.675¢	5.675¢	5.425¢
Cold finished bar	7.65	7.65	7.65	7.30
Alloy bars	6.725	6.725	6.725	6.475
Structural shapes	5.50	5.50	5.50	5.275
Stainless bars (No. 302)	45.00	45.00	45.00	45.00
Wrought iron bars	14.90	14.90	14.90	14.45
Wire: (per pound)				
Bright wire	8.00¢	8.00¢	8.00¢	7.65¢
Rails: (per 100 lb.)				
Heavy rails	\$5.75	\$5.75	\$5.75	\$5.525
Light rails	6.725	6.725	6.725	6.50
Semifinished Steel: (per net ton)				
Re-rolling billets	\$80.00	\$80.00	\$80.00	\$77.50
Slabs, re-rolling	80.00	80.00	80.00	77.50
Forging billets	99.50	99.50	99.50	96.00
Alloy blooms, billets, slabs	119.00	119.00	119.00	114.00
Wire Rods and Skelp: (per pound)				
Wire rods	6.40¢	6.40¢	6.40¢	6.15¢
Skelp	5.05	5.05	5.05	4.875
Finished Steel Composite: (per pound)				
Base price	6.196¢	6.196¢	6.196¢	5.967¢

Finished Steel Composite

Weighed index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold rolled sheets and strips.

Pig Iron Composite

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo and Birmingham.

Steel Scrap Composites

Average of No. 1 heavy melting steel scrap and No. 2 bundles delivered to consumers at Pittsburgh, Philadelphia and Chicago.

	Dec. 16 1958	Dec. 9 1958	Nov. 18 1958	Dec. 17 1957
Pig Iron: (per gross ton)				
Foundry, del'd Phila.	\$70.57	\$70.57	\$70.57	\$70.51
Foundry, Southern Cin'ti	73.87	73.87	73.87	71.65
Foundry, Birmingham	62.50	62.50	62.50	62.50
Foundry, Chicago	66.50	66.50	66.50	66.50
Basic, del'd Philadelphia	70.07	70.07	70.07	70.01
Basic, Valley furnace	66.00	66.00	66.00	66.00
Malleable, Chicago	66.50	66.50	66.50	66.50
Malleable, Valley	66.50	66.50	66.50	66.50
Ferromanganese, 74-76 pct Mn, cents per lb.†	12.25	12.25	12.25	12.25
Pig Iron Composite: (per gross ton)				
Pig iron	\$66.41	\$66.41	\$66.41	\$66.42
Scrap: (per gross ton)				
No. 1 steel, Pittsburgh	\$42.50	\$42.50	\$44.50	\$32.50
No. 1 steel, Phila. area	33.50	33.50	36.50	33.00
No. 1 steel, Chicago	43.50	43.50	42.50	30.50
No. 1 bundles, Detroit	35.50	35.50	36.50	21.50
Low phos., Youngstown	44.50	43.50	46.50	32.50
No. 1 mach'y cast, Pittsburgh	50.50	51.50	51.50	50.50
No. 1 mach'y cast, Phila.	48.50	48.50	49.50	50.50
No. 1 mach'y cast, Chicago	53.50	53.50	53.50	40.50
Steel Scrap Composites: (per gross ton)				
No. 1 hvy. melting scrap	\$39.83	\$39.83	\$41.17	\$32.00
No. 2 bundles	29.00	28.17	29.33	24.00
Coke, Connellsville: (per net ton at oven)				
Furnace coke, prompt	\$14.50	\$14.50	\$14.50	\$15.38
Foundry coke, prompt	\$18-18.50	\$18-18.50	\$18-18.50	\$17.50-19
Nonferrous Metals: (cents per pound to large buyers)				
Copper, electrolytic, Conn.	29.00	29.00	29.00	27.00
Copper, Lake, Conn.	29.00	29.00	29.00	27.00
Tin, Straits, N. Y.	99.125†	99.375	99.25	93.625
Zinc, East St. Louis	11.50	11.50	11.50	10.00
Lead, St. Louis	12.80	12.80	12.80	12.80
Aluminum, virgin ingot	26.80	26.80	26.80	28.10
Nickel, electrolytic	74.00	74.00	74.00	74.00
Magnesium, ingot	36.00	36.00	36.00	36.00
Antimony, Laredo, Tex.	29.50	29.50	29.50	33.00

† Tentative. ‡ Average. * Revised.

INDEX TO PRICE PAGES

Prices At a Glance	121
Comparison of Prices	125
Bars	134
Billets, Blooms and Slabs	132
Boiler Tubes	136
Bolts, Nuts, Rivets, Screws	137
Clad Steel	136
Coke	136
Electrical Sheets	136
Electrodes	136
Electroplating Supplies	137
Ferroalloys	139
Iron Ore	136
Merchant Wire Products	136
Metal Powders	137
Nonferrous	
Mill Products	131
Primary Prices	125, 130, 131
Remelted Metals	131
Scrap	131
Pig Iron	138
Piling	132
Pipe and Tubing	135
Plates	134
Rails	136
Refractories	136
Service Center Prices	137
Shapes	132
Sheets	133
Spring Steel	136
Stainless	138
Steel Scrap	128
Strip	132
Structurals	132
Tinplate	133
Wire	134
Wire Rod	133
Tool Steel	136
Track Supplies	136
Water Pipe Index	137



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Write for Bulletin No. 31-300-N

Thermo Electric Co., Inc.
SADDLE BROOK, NEW JERSEY
In Canada—THERMO ELECTRIC (Canada) Ltd., Brampton, Ont.

Upturn May Follow Year-End Lull

Activity is at a minimum and prices are unchanged in most markets.

But there are signs that scrap prices may start rising after Jan. 1.

■ Activity in the scrap market slowed down considerably in the past week. A tapering off of sales can be expected this time of year as mills trim their year-end inventories for tax purposes.

Adding to the slowdown at the dealer level is the weather. Unusually severe snowstorms in many districts have reduced yard intake to a trickle.

Prices generally are holding steady and there are signs a strengthening may begin after Jan. 1. Dealer resistance in Chicago is resuming. The feeling of optimism apparently has spread eastward, where it is reported the flow of distress tonnage to Pittsburgh has dropped sharply.

Furthermore, there is a possibility of new export business for East Coast ports in the near future. West Coast scrap markets have already received a shot in the arm from Japanese export orders.

But the underlying factor in dealer optimism is the steadily climbing steel operating rate. The day is not too far off, the trade feels, when many large mills will have to start rebuilding scrap inventories.

With the year-end lull setting in, The IRON AGE heavy melting Composite Price remained unchanged at \$39.83.

Pittsburgh—Existing prices were confirmed last week by a mill order for No. 1 heavy melting at \$43, No. 2 heavy melting at \$36, and No. 2 bundles at \$32. The order is for January shipment. It is reported to run 20,000 tons or better. Coming after an extended buying lag, the purchase had the effect of firming the market. However, only a limited number of suppliers participated in the buy.

Chicago—With yard activity at a minimum, scrap prices froze at last week's levels. Mill attempts to reduce offering prices met strong dealer resistance. And as bad weather held for an entire week, dealer asking prices began to move up. Brokers continue to lay down scrap for January sale.

Philadelphia—Very little material is moving in the district. Open-hearth scrap prices are unchanged for the moment, but there are indications that at least one sale is forthcoming at above quoted levels. Price of machine shop turnings last week should have shown a \$2 spread as two sales were made, one at \$19 and the other at \$18. Cupola cast is down \$1.

New York—This market is quiet. Little improvement is expected in either domestic or export business until after the first of the year. Mixed yard cast is down \$1 by virtue of a small sale at the lower price.

Detroit — Continuation of the cold snap and the desire to hold year-end inventories down has slowed movement of scrap at the

dealer level. Strike at Chrysler has virtually halted all industrial scrap production from that source, bolstering the dealer market to some extent.

Cleveland—A Valley area electric furnace mill upped its price \$1 for high grade scrap to keep it coming in—but the rest of the market is slow. Heavy shipment of distress scrap from the East is continuing to arrive in the Valley by truck.

St. Louis—Scrap is moving to mills at moderate levels. Some softening has developed in railroad grades. No. 1 railroad heavy melting is down \$1. Little interest was shown in 20 to 25 carloads offered by one railroad. Stove plate, however, is up \$1.

Cincinnati—Prices edged up 50¢ on No. 1 and No. 2 heavy melting as a local mill entered the market. Dealers are willing to ship at present prices but mills do not appear too anxious to buy.

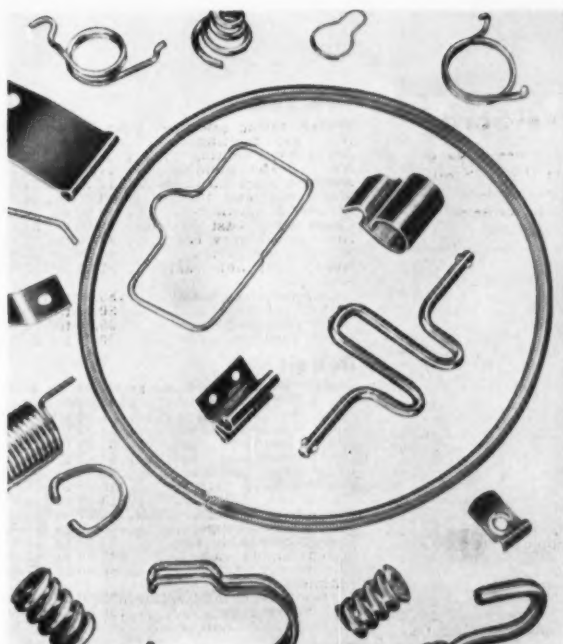
Buffalo—Mills are still shipping on old orders but no new business is expected before the end of the year. A little scrap is entering the district via the Lakes but this will cease when the shipping season ends this week.

Boston — Market tone is little changed. But prices appear to have stabilized after weeks of weakness. Machine shop turnings advanced \$1 a ton.

West Coast—The flow of scrap is more than adequate despite export orders. Top steelmaking grades are reported weak in San Francisco.

Houston—No. 1 heavy melting dropped \$2 on appraisal. Turnings are down \$1. There is still no market and outlook is not encouraging. The district mill says its purchases for January will be small, if at all.

Birmingham—The market continues dull with few sales reported. No pickup is expected before the turn of the year. Dealer resistance is weakening.



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WICKWIRE SPENCER STEEL DIVISION

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MULTIPLE SPINDLE

CHUCKING MACHINES

Four, Five, Six, Eight Spindles • Work and Tool Rotating Type
GOSS & DE LEEUW MACHINE CO., KENSINGTON, CONN.

IF IT'S ACTION YOU'RE AFTER . . .

Advertise in The IRON AGE. Purchase-Decision executives in metalworking watch The IRON AGE advertising pages every week.

A. J. BOYNTON AND CO.

CONSULTING ENGINEERS

109 N. Wabash Ave., Chicago 2, Ill.



for Corrugating and Complete Line of Culvert Equipment—Slitting and Coiling Equipment for Ferrous and Non-Ferrous Material in All Capacities—Warehouse and Steel Mill Cut to Length Lines for Shearing and Levelling Sheets from Coils—Shears for Shearing Sheets and Plates Both Underdriven and Overdriven Types in Capacities to 1 1/4" Plate.

STAMCO, Inc., New Bremen, Ohio

SCRAP PRICES (Effective Dec. 16, 1958)

Pittsburgh

No. 1 hvy. melting	\$42.00 to \$43.00
No. 2 hvy. melting	35.00 to 36.00
No. 1 dealer bundles	42.00 to 43.00
No. 1 factory bundles	47.00 to 48.00
No. 2 bundles	31.00 to 32.00
No. 1 busheling	42.00 to 43.00
Machine shop turn.	20.00 to 21.00
Shoveling turnings	24.00 to 25.00
Cast iron borings	24.00 to 25.00
Low phos. punch's plate	48.00 to 49.00
Heavy turnings	36.00 to 37.00
No. 1 RR hvy. melting	45.00 to 46.00
Scrap rails, random lgth.	54.00 to 55.00
Rails 2 ft and under	57.00 to 58.00
RR specialties	48.00 to 49.00
No. 1 machinery cast.	50.00 to 51.00
Cupola cast.	44.00 to 45.00
Heavy breakable cast.	42.00 to 43.00
Stainless	
18-8 bundles and solids	225.00 to 230.00
18-8 turnings	125.00 to 130.00
430 bundles and solids	125.00 to 130.00
410 turnings	50.00 to 60.00

Chicago

No. 1 hvy. melting	\$43.00 to \$44.00
No. 2 hvy. melting	38.00 to 39.00
No. 1 dealer bundles	43.00 to 44.00
No. 1 factory bundles	47.50 to 49.00
No. 2 bundles	31.00 to 32.00
No. 1 busheling	42.00 to 43.00
Machine shop turn.	22.00 to 23.00
Mixed bor. and turn.	24.00 to 25.00
Shoveling turnings	24.00 to 25.00
Cast iron borings	23.00 to 24.00
Low phos. forge crops	52.00 to 53.00
Low phos. punch's plate	48.00 to 49.00
Low phos. 3 ft and under	46.00 to 47.00
No. 1 RR hvy. melting	46.00 to 47.00
Scrap rails, random lgth.	52.00 to 53.00
Rerolling rails	53.00 to 64.00
Rails 2 ft and under	59.00 to 60.00
Angles and splice bars	54.00 to 55.00
RR steel car axles	71.00 to 72.00
RR couplers and knuckles	51.00 to 52.00
No. 1 machinery cast.	53.00 to 54.00
Cupola cast.	47.00 to 48.00
Heavy breakable cast.	41.00 to 42.00
Cast iron wheels	42.00 to 43.00
Malleable	56.00 to 57.00
Stove plate	44.00 to 45.00
Steel car wheels	52.00 to 53.00
Stainless	
18-8 bundles and solids	220.00 to 225.00
18-8 turnings	130.00 to 135.00
430 bundles and solids	115.00 to 120.00
430 turnings	65.00 to 70.00

Philadelphia Area

No. 1 hvy. melting	\$33.00 to \$34.00
No. 2 hvy. melting	30.00 to 31.00
No. 1 dealer bundles	34.00 to 35.00
No. 2 bundles	23.50 to 24.50
No. 1 busheling	32.00 to 34.00
Machine shop turn.	17.00 to 19.00
Mixed bor. short turn.	18.00 to 20.00
Cast iron borings	18.00 to 20.00
Shoveling turnings	20.00 to 22.00
Clean cast. chem. borings	32.00 to 33.00
Low phos. 5 ft and under	38.00 to 39.00
Low phos. 2 ft punch's	35.00 to 40.00
Elec. furnace bundles	35.00 to 37.00
Heavy turnings	29.00 to 30.00
RR specialties	43.00 to 44.00
Rails 18 in. and under	57.00 to 58.00
Cupola cast.	38.00 to 39.00
Heavy breakable cast.	40.00 to 41.00
Cast iron car wheels	44.00 to 45.00
Malleable	61.00 to 62.00
No. 1 machinery cast.	48.00 to 49.00

Cincinnati

Brokers buying prices per gross ton on cars:	
No. 1 hvy. melting	\$36.00 to \$37.00
No. 2 hvy. melting	31.00 to 32.00
No. 1 dealer bundles	35.50 to 36.50
No. 2 bundles	24.00 to 25.00
Machine shop turn.	17.00 to 18.00
Shoveling turnings	20.00 to 21.00
Cast iron borings	18.00 to 19.00
Low phos. 18 in. and under	45.00 to 46.00
Rails, random length	49.00 to 50.00
Rails, 18 in. and under	55.00 to 56.00
No. 1 cupola cast.	44.00 to 45.00
Hvy. breakable cast.	39.00 to 40.00
Drop broken cast.	47.00 to 48.00

Youngstown

No. 1 hvy. melting	\$41.00 to \$42.00
No. 2 hvy. melting	33.00 to 34.00
No. 1 dealer bundles	41.00 to 42.00
No. 2 bundles	29.00 to 30.00
Machine shop turn.	19.50 to 20.50
Shoveling turnings	19.50 to 20.50
Low phos. plate	44.00 to 45.00

Iron and Steel Scrap

Going prices of iron and steel scrap as obtained in the trade by THE IRON AGE based on representative tonnages. All prices are per gross ton delivered to consumer unless otherwise noted.

Cleveland

No. 1 hvy. melting	\$37.50 to \$38.50
No. 2 hvy. melting	29.50 to 30.50
No. 1 dealer bundles	37.50 to 38.50
No. 1 factory bundles	43.00 to 44.00
No. 2 bundles	25.50 to 26.50
No. 1 busheling	37.50 to 38.50
Machine shop turn.	15.50 to 16.50
Mixed bor. and turn.	20.50 to 21.50
Shoveling turnings	20.50 to 21.50
Cast iron borings	20.50 to 21.50
Cut structural & plates, 2 ft & under	46.50 to 47.50
Drop forge flashings	37.50 to 38.50
Low phos. punch's plate	38.50 to 39.50
Foundry steel, 2 ft & under	39.00 to 40.00
No. 1 RR hvy. melting	45.00 to 46.00
Rails 2 ft and under	56.00 to 57.00
Rails 18 in. and under	57.00 to 58.00
Steel axle turnings	25.00 to 26.00
Railroad cast.	50.00 to 51.00
No. 1 machinery cast.	49.00 to 50.00
Stove plate	45.00 to 46.00
Malleable	61.00 to 62.00
Stainless	
18-8 bundles	215.00 to 220.00
18-8 turnings	115.00 to 120.00
430 bundles	120.00 to 125.00

Buffalo

No. 1 hvy. melting	\$34.00 to \$35.00
No. 2 hvy. melting	27.00 to 28.00
No. 1 busheling	34.00 to 35.00
No. 1 dealer bundles	34.00 to 35.00
No. 2 bundles	25.00 to 26.00
Machine shop turn.	15.00 to 16.00
Mixed bor. and turn.	17.00 to 18.00
Shoveling turnings	21.00 to 22.00
Cast iron borings	15.00 to 16.00
Low phos. plate	39.00 to 40.00
Structural and plate 2 ft and under	44.00 to 45.00
Scrap rails, random lgth.	46.00 to 47.00
Rails 2 ft and under	56.00 to 57.00
No. 1 machinery cast.	48.00 to 49.00
No. 1 cupola cast.	44.00 to 45.00

St. Louis

No. 1 hvy. melting	\$37.00 to \$38.00
No. 2 hvy. melting	35.00 to 36.00
No. 1 dealer bundles	40.00 to 41.00
No. 2 bundles	28.00 to 29.00
Machine shop turn.	18.00 to 19.00
Shoveling turnings	20.00 to 21.00
Cast iron borings	22.00 to 23.00
No. 1 RR hvy. melting	44.00 to 45.00
Rails, random lengths	47.00 to 48.00
Rails, 18 in. and under	52.00 to 53.00
Angles and splice bars	46.00 to 47.00
RR specialties	46.00 to 47.00
Cupola cast.	48.00 to 49.00
Heavy breakable cast.	38.00 to 39.00
Cast iron brake shoes	38.00 to 39.00
Stove plate	43.00 to 44.00
Cast iron car wheels	44.00 to 45.00
Rerolling rails	59.00 to 60.00
Unstripped motor blocks.	39.00 to 40.00

Birmingham

No. 1 hvy. melting	\$35.00 to \$36.00
No. 2 hvy. melting	28.00 to 29.00
No. 1 dealer bundles	35.00 to 36.00
No. 2 bundles	21.00 to 22.00
No. 1 busheling	35.00 to 36.00
Machine shop turn.	21.00 to 22.00
Shoveling turnings	22.00 to 23.00
Cast iron borings	13.00 to 14.00
Electric furnace bundles.	37.00 to 38.00
Elec. furnace, 3 ft & under	35.00 to 36.00
Bar crops and plate	42.00 to 43.00
Structural and plate, 2 ft.	37.00 to 38.00
No. 1 RR hvy. melting	49.00 to 50.00
Scrap rails, random lgth.	44.00 to 45.00
Rails, 18 in. and under	49.00 to 50.00
Angles and splice bars	45.00 to 46.00
Rerolling rails	54.00 to 55.00
No. 1 cupola cast.	52.00 to 53.00
Stove plate	53.00 to 54.00
Cast iron car wheels	41.00 to 42.00
Unstripped motor blocks.	40.00 to 41.00

New York

Brokers buying prices per gross ton on cars:	
No. 1 hvy. melting	\$26.00 to \$27.00
No. 2 hvy. melting	23.00 to 24.00
No. 2 dealer bundles	17.00 to 18.00
Machine shop turnings	10.00 to 11.00
Mixed bor. and turn.	13.00 to 14.00
Shoveling turnings	14.00 to 15.00
Clean chem. cast. borings	25.00 to 26.00
No. 1 machinery cast.	37.00 to 38.00
Mixed yard cast	33.00 to 34.00
Heavy breakable cast.	32.00 to 33.00
Stainless	
18-8 prepared solids	185.00 to 190.00
18-8 turnings	80.00 to 85.00
430 prepared solids	65.00 to 70.00
430 turnings	20.00 to 25.00

Detroit

Brokers buying prices per gross ton on cars:	
No. 1 hvy. melting	\$33.00 to \$34.00
No. 2 hvy. melting	26.00 to 27.00
No. 1 dealer bundles	35.00 to 36.00
No. 2 bundles	21.00 to 22.00
No. 1 busheling	33.00 to 34.00
Drop forge flashings	32.00 to 33.00
Machine shop turn.	13.00 to 14.00
Mixed bor. and turn.	13.00 to 14.00
Shoveling turnings	15.00 to 16.00
Cast iron borings	15.00 to 16.00
Heavy breakable cast.	33.00 to 34.00
Mixed cupola cast.	41.00 to 42.00
Automotive cast.	46.00 to 47.00
Stainless	
18-8 bundles and solids	205.00 to 210.00
18-8 turnings	100.00 to 105.00
430 bundles and solids	105.00 to 110.00

Boston

Brokers buying prices per gross ton on cars:	
No. 1 hvy. melting	\$24.00 to \$25.00
No. 2 hvy. melting	20.00 to 21.00
No. 1 dealer bundles	31.00 to 32.00
No. 2 bundles	13.00 to 14.00
No. 1 busheling	24.00 to 25.00
Machine shop turn.	8.00 to 9.00
Shoveling turnings	10.00 to 11.00
Clean cast. chem. borings	19.00 to 20.00
No. 1 machinery cast.	31.00 to 32.00
Mixed cupola cast.	31.00 to 32.00
Heavy breakable cast.	28.00 to 30.00
Stove plate	29.00 to 30.00

San Francisco

No. 1 hvy. melting	\$36.00
No. 2 hvy. melting	34.00
No. 1 dealer bundles	\$32.00 to 34.00
No. 2 bundles	22.00
Machine shop turn.	15.00
Cast iron borings	15.00
No. 1 cupola cast.	45.00

Los Angeles

No. 1 hvy. melting	\$37.00
No. 2 hvy. melting	35.00
No. 1 dealer bundles	\$33.00 to 34.00
No. 2 bundles	20.00
Machine shop turn.	15.00
Shoveling turnings	17.00 to 18.00
Cast iron borings	17.00 to 18.00
Elec. turn. 1 ft and under (foundry)	48.00
No. 1 cupola cast.	45.00 to 47.00

Seattle

No. 1 hvy. melting	\$30.00
No. 2 hvy. melting	28.00
No. 2 bundles	22.00
No. 1 cupola cast.	36.00
Mixed yard cast.	36.00

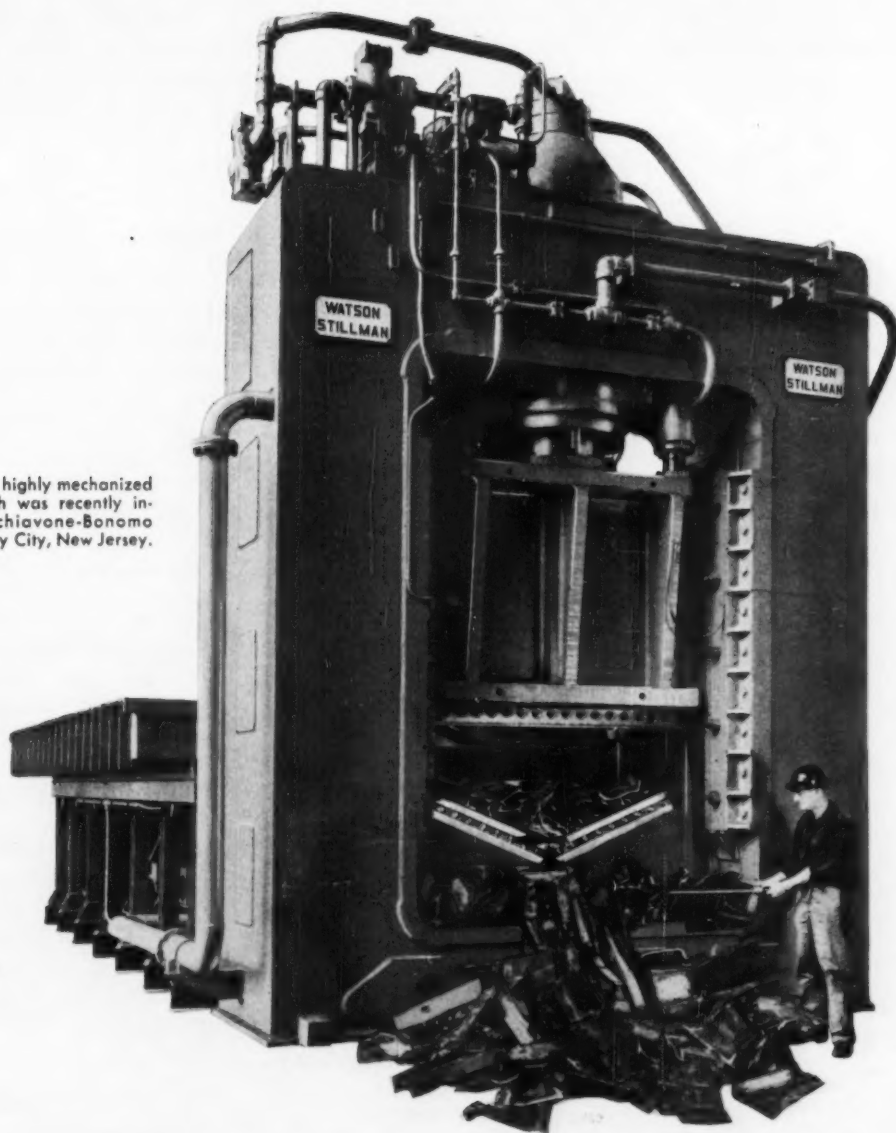
Hamilton, Ont.

Brokers buying prices per gross ton on cars:	
No. 1 hvy. melting	\$34.50
No. 2 hvy. melting	30.50
No. 1 dealer bundles	34.50
No. 2 bundles	26.00
Mixed steel scrap	26.50
Bush, new fact, prep'd.	34.50
Bush, new fact, unprep'd	28.50
Machine shop turn.	15.00
Short steel turn.	19.00
Mixed bor. and turn.	15.00
Rails, rerolling	39.00
Cast scrap	\$39.00 to 41.00

Houston

Brokers buying prices per gross ton on cars:	
No. 1 hvy. melting	\$36.00
No. 2 hvy. melting	32.00
No. 2 bundles	23.00
Machine shop turn.	15.00
Shoveling turnings	19.00
Cut structural plate 2 ft under	\$41.00 to 42.00
Unstripped motor blocks.	33.00 to 34.00
Cupola cast.	44.00 to 45.00
Heavy breakable cast.	26.50 to 27.50

Watson-Stillman's highly mechanized scrap shear which was recently installed at the Schiavone-Bonomo Corporation, Jersey City, New Jersey.



NEW 750-TON SCRAP SHEAR

Flexibility . . . combined with big output and economy of operation . . . these are the primary advantages of Watson-Stillman's new 750-ton hydraulic scrap shear. Arranged for manual and semi-automatic operation, all movements are controlled from the operator's station.

It will cut, in an 8-hour day, approximately 150 tons of miscellaneous junk-yard scrap, 200 tons of industrial scrap or 250 tons of uniform plate scrap. The machine is designed for outdoor installation, and can be operated in any weather.

Only three men are needed for the job: one to run the shear, one to operate a crane and one to watch for

derelict material in loading. As a result, labor cost can be reduced by as much as 75%.

New bulletin 390 gives design details and additional specifications. Send for a **FREE** copy today.

WATSON-STILLMAN PRESS DIVISION
FARREL-BIRMINGHAM COMPANY, INC.
 565 Blossom Road, Rochester 10, New York
 Telephone: BUtter 8-4600
 Plants: Ansonia and Derby, Conn.,
 Buffalo and Rochester, N. Y.

SPECIFICATIONS

Capacity.....	750 tons
Stroke.....	36"
Shear cycle.....	16 seconds
Floor space required	16'0" x 57'3"
Height.....	21'0"

WATSON-STILLMAN®

WS-54

Will Quotas Control Lead Imports?

It's an academic question now because the market is off.

But observers say there are loopholes in lead quotas through which importers could pour their metal.

■ "If the U. S. market really gets going the import quotas will harass but not stop foreign lead producers from getting more than their share."

This is the opinion of a domestic lead producer and seller.

What he means is that as the official restrictions on the import of lead and lead ores are more closely examined, several loopholes or possible loopholes show up.

Slow Market — Right now they are highly problematical. Even if foreign sellers could skirt the restrictions they probably couldn't move their metal. A combination of three major factors has the domestic market dragging along at a lethargic pace.

First, business of the major lead users is improving very slowly, compared to the general economy. Second, even this improvement is not showing up much now because hedge buying in September and October brought inventories to satisfactory levels for current business. And third, inventories are taxed in some states so that consumers tend to let them dwindle in December.

Skirting the Quotas—Here are two possible loopholes:

The proclamation of import restrictions refers to lead metal as "the product of a country." Suppose, say some market observers, lead ore or

scrap were brought into bonded warehouses in the U. S. It would not be taxable until it left the warehouse for consumption in the U. S. If this material were converted to metal in the warehouse it would not be the "product of a country" (other than the U. S.) since its value would be as a metal.

Government sources do not concede this loophole. They agree that advocates may have some legal grounds for their contention, but they say this could be blocked by another proclamation, or maybe even by an appropriate interpretation of the rule by the Customs Bureau.

Open to Semi-Finished — But here's one that won't be solved so easily. The restrictions do not apply to fabricated or semi-finished products. In other words, while a foreign supplier must bring lead pig or bullion in under quotas, he can send in all the lead sheet or mill forms he wants, subject only to duty.

One domestic producer estimates that most foreign suppliers have about a 4¢ advantage on the U. S. makers, after tariff. "Instead of casting the metal into pigs," he says, "the foreign smelter can cast it in a shape. A buyer can toss a shape in his pot as easily as a standard pig, especially if he can get it a cent or two cheaper."

This loophole is no accident. The Tariff Commission recognized the possibility, but says it was asked only for protection from foreign ore and primary metal. It did not have the authority to block semi-finished items.

If this ever becomes the practice the domestic industry will have to go through the same rigmarole to get it blocked as they did to get the current quotas. It will take plenty of time.

Nickel

Nickel consumers really settled comfortably in the driver's seat in 1958. And it looks like it will be some time before they have to step down—if ever.

Nickel capacity in the Free World hit 525 million lb in 1958, says Dr. John F. Thompson, International Nickel chairman. This is a new high.

Further, capacity will hit about 550 million lb in 1959, 600 million lb in 1960, and 650 million in 1961, estimates Dr. Thompson.

On the other side of the coin, the Inco head estimates 1958 consumption at only 325 to 335 million lb. And since inventories were reduced, deliveries were even lower, he says.

Inco is not completely unhappy about the situation, says Mr. Thompson.

Tin prices for the week: Dec. 10—99.125; Dec. 11—99.125; Dec. 12—99.00; Dec. 15—99.00; Dec. 16—99.125.*

* Estimate.

Primary Prices

(cents per lb)	current price	last price	date of change
Aluminum pig	24.70	24.00	8/1/58
Aluminum ingot	26.00	26.10	8/1/58
Copper (E)	29.90	27.80	10/23/58
Copper (CS)	29.00	29.80	11/26/58
Copper (L)	29.00	27.80	10/23/58
Lead, St. L.	12.00	12.30	10/14/58
Lead, N. Y.	13.00	12.80	10/14/58
Magnesium ingot	30.00	34.00	8/13/58
Magnesium pig	35.25	33.75	8/13/58
Nickel	74.00	84.50	12/6/58
Titanium sponge	162-182	185-208	11/3/58
Zinc, E. St. L.	11.50	11.00	11/7/58
Zinc, N. Y.	12.00	11.50	11/7/58

ALUMINUM: 99% Ingot fct allwd. **COPPER:** (E) = electrolytic, (CS) = custom smelters, electrolytic, (L) = lake. **LEAD:** common grade. **MAGNESIUM:** 99.8% pig Velasco, Tex. **NICKEL:** Port Colbourne, Canada. **ZINC:** prime western. **TIN:** see above; other primary prices, pg. 131.

NONFERROUS PRICES

MILL PRODUCTS

(Cents per lb unless otherwise noted)

ALUMINUM

(Base 30,000 lb, f.o.b. ship pt., frt. allowed)

Flat Sheet (Mill Finish and Plate)

("F" temper except 6061-0)

Alloy	.002	.081	.136	250-
			.249	3
1100, 3003.....	45.7	43.8	42.8	43.3
5052.....	53.1	48.4	46.9	46.0
6061-0.....	50.1	45.7	43.9	44.9

Extruded Solid Shapes

Factor	6063 T-5	6062 T-6
6-8.....	42.7-44.2	51.1-54.8
12-14.....	42.7-44.2	52.0-56.5
24-28.....	43.2-44.7	62.5-67.5
36-38.....	46.7-49.2	86.9-90.5

Screw Machine Stock—2011-T-3

Size*	3/4	3/8-5/8	1/2-1	1 1/4-1 1/2
Price.....	62.0	61.2	60.7	57.3

Roofing Sheet, Corrugated

(Per sheet, 26" wide base, 16,000 lb)

Length*→	72	96	120	144
.019 gage.....	\$1.411	\$1.884	\$2.353	\$2.823
.024 gage.....	1.762	2.349	2.937	3.524

MAGNESIUM

(F.o.b. shipping Pt., carload frt. allowed)

Sheet and Plate

Type→	Gage→	250	250-	.188	.081	.002
		3.00	2.00			
AZ31B Stand, Grade.....		67.9	69.0	77.9	106.1	
AZ31B Spec.....		93.3	95.7	108.7	171.3	
Tread Plate.....		70.6	71.7			
Tooling Plate.....		73.0				

Extruded Shapes

Factor→	6-8	12-14	24-28	36-38
Comm. Grade. (AZ31C).....	69.6	70.7	75.6	89.2
Spec. Grade... (AZ31B).....	84.6	85.7	90.6	104.2

Alloy Ingot

AZ91B (Die Casting)..... 37.25 (delivered)
AZ63A, AZ92A, AZ91C (Sand Casting) 40.75 (Velasco, Tex.)

NICKEL, MONEL, INCONEL

(Base prices f.o.b. mill)

"A" Nickel Monel

	Nickel Monel	Inconel
Sheet, CR.....	126	128
Strip, CR.....	124	138
Rod, bar, HR.....	107	109
Angles, HR.....	107	109
Plates, HR.....	120	121
Seamless tube.....	157	200
Shot, blocks.....	87	...

COPPER, BRASS, BRONZE

(Freight included in 5000 lbs)

	Sheet	Wire	Rod	Tube
Copper.....	53.13	50.36	53.32	
Brass, Yellow.....	46.57	47.11	46.51	49.98
Brass, Low.....	49.33	49.77	49.17	52.54
Brass, R L.....	50.17	50.71	50.11	53.45
Brass, Naval.....	51.24	45.05	54.65	
Muntz Metal.....	49.35	44.66		
Comm. Bs.....	51.65	52.19	51.59	54.71
Mang. Bs.....	54.94	48.04		
P200. Bs. 5%.....	72.52	73.09		
Free Cutting Brass Rod.....			31.22	

TITANIUM

(Base prices, f.o.b. mill)

Sheet and strip, commercially pure, \$8.50-\$10.10; alloy, \$15.95; Plate, HR, commercially pure, \$6.00-\$6.75; alloy, \$8.75-\$9.50. Wire, rolled and/or drawn, commercially pure, \$6.50-\$7.00; alloy, \$10.00-\$11.50; Bar, HR or forged, commercially pure, \$5.10-\$5.50; alloy, \$5.10-\$6.35; billets, HR, commercially pure, \$3.80-\$4.35; alloy, \$3.80-\$4.20.

PRIMARY METAL

(Cents per lb unless otherwise noted)

Antimony, American, Laredo, Tex., 29.50
Beryllium aluminum 5% Be, Dollar
per lb contained Be.....\$74.75
Beryllium copper, per lb contained Be.....\$43.00
Beryllium 97% lump or beads,
f.o.b. Cleveland, Reading.....\$71.50
Bismuth, ton lots.....\$ 2.25
Cadmium, de'd.....\$ 1.45
Calcium, 99.9% small lots.....\$ 4.55
Chromium, 99.8% metallic basis.....\$ 1.31
Cobalt, 97-99% (per lb).....\$2.00 to \$2.07
Germanium, per gm, f.o.b. Miami,
Okla., refined.....\$35.00 to \$42.00
Gold, U. S. Treas., per troy oz.....\$35.00
Indium, 99.9% dollars per troy oz.....\$ 2.25
Iridium, dollars per troy oz.....\$70 to \$80
Lithium, 98%.....\$11.00 to \$14.00
Magnesium, sticks, 100 to 500 lb.....\$9.00
Mercury, dollars per 76-lb flask,
f.o.b. New York.....\$224 to \$228
Nickel oxide sinter at Buffalo, N. Y.,
or other U. S. points of entry.....\$ 69.60
or contained nickel.....\$15 to \$17
Palladium, dollars per troy oz.....\$50 to \$55
Rhodium.....\$120.00 to \$125.00
Silver ingots (¢ per troy oz.).....\$9.625
Thorium, per kg.....\$43.00
Vanadium.....\$ 3.45
Zirconium sponge.....\$ 5.00

REMETLED METALS

Brass Ingot

(Cents per lb delivered, carloads)

85-5-5 ingot.....28.00
No. 115.....27.00
No. 120.....26.00
80-10-10 ingot.....32.25
No. 305.....30.25
No. 315.....39.75
88-10-2 ingot.....35.50
No. 210.....32.25
No. 215.....23.00
No. 245.....24.75
Yellow ingot.....23.00
No. 405.....24.75
Manganese bronze.....24.75
No. 421.....24.75

Aluminum Ingot

(Cents per lb del'd 30,000 lb and over)

95-5 aluminum-silicon alloys
0.30 copper max.....24.75-25.00
0.60 copper max.....24.50-24.75
Piston alloys (No. 122 type).....24.25-25.25
No. 12 alum (No. 2 grade).....21.50-22.00
108 alloy.....22.00-22.50
195 alloy.....25.00-26.00
13 alloy (0.60 copper max.).....24.25-24.75
AXS-679 (1 pct zinc).....21.75-22.25

Steel deoxidizing aluminum notch bar granulated or shot

Grade 1-95-97 1/2%.....	22.50-23.50
Grade 2-92-95%.....	21.25-22.25
Grade 3-90-92%.....	20.25-21.25
Grade 4-85-90%.....	17.50-18.50

SCRAP METALS

Brass Mill Scrap

(Cents per pound, add 1¢ per lb for shipments of 20,000 lb and over)

	Heavy	Turnings
Copper.....	25	24 1/4
Yellow brass.....	19	17 1/4
Red brass.....	22 1/2	21 1/2
Comm. bronze.....	22 1/2	22 1/2
Mang. bronze.....	17 1/2	16 1/2
Free cutting rod ends.....	18 1/2	

Customs Smelters Scrap

(Cents per pound carload lots, delivered to refinery)

No. 1 copper wire.....	24 1/4
No. 2 copper wire.....	22 3/4
Light copper.....	20 3/4
*Refinery brass.....	22 3/4
Copper bearing material.....	21 1/4
*Dry copper content.....	

Ingot Makers Scrap

(Cents per pound carload lots, delivered to refinery)

No. 1 copper wire.....	24 1/4
No. 2 copper wire.....	22 3/4
Light copper.....	20 3/4
No. 1 composition.....	19
No. 1 comp. turnings.....	18 1/2
Hvy. yellow brass solids.....	14 1/4
Brass pipe.....	15 1/2
Radiators.....	15 1/2

Aluminum

Mixed old cast.....	12	—13
Mixed new clips.....	15	—16
Mixed turnings, dry.....	13	—14

Dealers' Scrap

(Dealers' buying price f.o.b. New York in cents per pound)

Copper and Brass	
No. 1 copper wire	21 1/2—22
No. 2 copper wire	19 1/2—20
Light copper	17 1/2—18
Auto radiators (unsweated)	13 1/2—13 3/4
No. 1 composition	16 1/2—17
No. 1 composition turnings	15 1/2—16
Cocks and faucets	13 1/2—14
Clean heavy yellow brass	11 1/2—12 1/4
Brass pipe	13 1/2—14
New soft brass clippings	14—14 1/2
No. 1 brass rod turnings	11 1/2—12

Aluminum

Alum. pistons and struts.....	6	—6 1/2
Aluminum crankcases.....	10	—10 1/2
1100 (28) aluminum clippings.....	13	—13 1/2
Old sheet and utensils.....	10	—10 1/2
Borings and turnings.....	6 1/2	—7
Industrial castings.....	10	—10 1/2
2020 (248) clippings.....	11 1/4	—11 3/4

Zinc

New zinc clippings.....	4 1/2	—5 1/4
Old zinc.....	3 1/2	—3 3/4
Zinc routings.....	2 1/4	—2 1/2
Old die cast scrap.....	2	—2 1/4

Nickel and Monel

Pure nickel clippings.....	52-54
Clean nickel turnings.....	37-40
Nickel anodes.....	52-54
Nickel rod ends.....	30-32
New Monel clippings.....	30-32
Clean Monel turnings.....	30-32
Old sheet Monel.....	26-28
Nickel silver clippings, mixed.....	15
Nickel silver turnings, mixed.....	15

Lead

Soft scrap lead.....	8	—8 1/4
Battery plates (dry).....	2 3/4	—3
Batteries, acid free.....	2 1/2	—2 3/4

Miscellaneous

Block tin.....	75	—76
No. 1 pewter.....	59	—60
Auto babbitt.....	39	—40
Mixer common babbitt.....	9 1/2	—10
Solder joints.....	13 1/4	—13 3/4
Siphon tops.....	42	
Small foundry type.....	10 1/4	—10 3/4
Monotype.....	10 1/4	—10 3/4
Lino. and stereotype.....	9 1/4	—9 3/4
Electrotype.....	8 1/4	—8 3/4
Hand picked type shells.....	6 1/4	—7
Lino. and stereo. dross.....	2 3/4	—3
Electro dross.....	2 1/4	—2 1/2

IRON AGE

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

STEEL
PRICESBILLETS, BLOOMS,
SLABSPIL-
INGSHAPES
STRUCTURALS

STRIP

	Carbon Re-rolling Net Ton	Carbon Forging Net Ton	Alloy Net Ton	Sheet Steel	Carbon	Hi Str. Low Alloy	Carbon Wide- Flange	Hot- rolled	Cold- rolled	Hi Str. H.R. Low Alloy	Hi Str. C.R. Low Alloy	Alloy Hot- rolled	Alloy Cold- rolled
EAST	Bethlehem, Pa.		\$119.00 B3		5.55 B3	8.10 B3	5.55 B3						
	Buffalo, N. Y.	\$80.00 R3, B3	\$99.50 R3, B3	\$119.00 R3, B3	6.50 B3	5.55 B3	8.10 B3	5.55 B3	5.10 B3, R3	7.425 S10, R7	7.575 B3		
	Phila., Pa.								7.875 P15				
	Harrison, N. J.												15.55 C11
	Conshechocken, Pa.		\$104.50 A2	\$126.00 A2				5.15 A2		7.575 A2			
	New Bedford, Mass.								7.875 R6				
	Johnstown, Pa.	\$80.00 B3	\$99.50 B3	\$119.00 B3		5.55 B3	8.10 B3						
	Boston, Mass.								7.975 T8				
	New Haven, Conn.								7.875 D1				
	Baltimore, Md.								7.425 T8				15.90 T8
	Phoenixville, Pa.				5.55 P2		5.55 P2						
	Sparrows Pt., Md.							5.10 B3		7.575 B3			
MIDDLE WEST	New Britain, Bridgeport, Wallingford, Conn.		\$119.00 N8						7.875 W1, S7				
	Pawtucket, R. I. Worcester, Mass.								7.975 N7, A5				15.90 N7 15.70 T8
	Alton, Ill.							5.30 L1					
	Ashland, Ky.							5.10 A7		7.575 A7			
	Canton-Massillon, Dover, Ohio		\$102.00 R3	\$119.00 R3, \$114.00 T3					7.425 G4		10.90 G4		
	Chicago, Ill. Franklin Park, Ill. Evanston, Ill.	\$80.00 U1, R3	\$99.50 U1, R3, W8	\$119.00 U1, R3, W8	6.50 U1	5.50 U1, W8, P15	8.05 U1, Y1, W8	5.50 U1	5.10 W8, N4, A1	7.525 A1, T8, M8	7.575 W8	8.40 W8, S9, I3	15.55 A1, S9, G4, T8
	Cleveland, Ohio								7.425 A5, J3		10.75 A5	8.40 J3	
	Detroit, Mich.			\$119.00 R5				5.10 G3, M2	7.425 M2, S1, D1, P11	7.575 G3	10.90 S1		
	Anderson, Ind.								7.425 G4				
	Gary, Ind. Harbor, Indiana	\$80.00 U1	\$99.50 U1	\$119.00 U1, Y1		5.50 U1, I3	8.05 U1, J3	5.50 I3	5.10 U1, I3, Y1	7.425 Y1	7.575 U1, I3, Y1	10.90 Y1	8.40 U1, Y1
	Sterling, Ill.	\$80.00 N4				5.50 N4		5.20 N4					
	Indianapolis, Ind.								7.575 R5				15.70 R5
WEST	Newport, Ky.							5.10 A9				8.40 A9	
	Niles, Warren, Ohio Sharon, Pa.		\$99.50 S1, C10	\$119.00 C10, S1				5.10 R3, S1	7.425 R3, T4, S1	7.575 R3, S1	10.90 R3, S1	8.40 S1	15.55 S1
	Owensboro, Ky.	\$80.00 G5	\$99.50 G5	\$119.00 G5									
	Pittsburgh, Midland, Butler, Aliquippa, McKeesport, Pa.	\$80.00 U1, P6	\$99.50 U1, C11, P6	\$119.00 U1, C11, B7	6.50 U1	5.50 U1, J3	8.05 U1, J3	5.50 U1	5.10 P6	7.425 J3, B4, 7.525 E3		8.40 S9	15.55 S9
	Weirton, Wheeling, Follansbee, W. Va.				6.50 U1, W3	5.50 W3		5.50 W3	5.10 W3	7.425 F3	7.575 W3	10.90 W3	
	Youngstown, Ohio	\$80.00 R3	\$99.50 Y1, C10	\$119.00 Y1			8.05 Y1		5.10 U1	7.425 Y1, R5	7.575 U1, Y1	10.95 Y1	8.40 U1, Y1
	Fontana, Cal.	\$90.50 K1	\$109.00 K1	\$140.00 K1		6.30 K1	8.85 K1	6.45 K1	5.825 K1	9.20 K1			
	Geneva, Utah		\$99.50 C7			5.50 C7	8.05 C7						
	Kansas City, Mo.					5.60 S2	8.15 S2					8.65 S2	
	Los Angeles, Torrance, Cal.		\$109.00 B2	\$139.00 B2		6.20 C7, B2	8.75 B2		5.85 C7, B2	9.30 C1, R5		9.00 B2	17.75 J3
	Minneapolis, Colo.					5.90 C6			6.20 C6	9.375 C6			
	Portland, Ore.					6.25 O2							
SOUTH	San Francisco, Niles, Pittsburg, Cal.		\$109.00 B2			6.15 B2	8.70 B2		5.85 C7, B2				
	Seattle, Wash.		\$113.00 B2			6.25 B2	8.80 B2		6.10 B2				
	Atlanta, Ga.					5.70 A8			5.10 A8				
	Fairfield, Ala. City, Birmingham, Ala.	\$80.00 T2	\$99.50 T2			5.50 T2 R3, C16	8.05 T2		5.10 T2, R3, C16		7.575 T2		
	Houston, Lone Star, Texas		\$104.50 S2	\$124.00 S2		5.60 S2	8.15 S2					8.65 S2	

(Effective Dec. 15, 1958)

IRON AGE

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

STEEL
PRICES

STEEL PRICES		SHEETS							WIRE ROD	TINPLATE†		Holloware Enameling 29 ga.	
		Hot-rolled 18 ga. & hvyr.	Cold- rolled	Galvanized (Hot-dipped)	Enamel- ing	Long Terns	Hi Str. Low Alloy H.R.	Hi Str. Low Alloy C.R.	Hi Str. Low Alloy Galv.		Cokes* 1.25-lb. base box		Electro** 0.25-lb. base box
EAST	Buffalo, N. Y.	5.10 B3	6.275 B3				7.525 B3	9.275 B3		6.40 W6	† Special coated mfg. terms deduct 50c from 1.25-lb. coke base box price. Can-making quality BLACKPLATE 55 to 128 lb. deduct \$2.20 from 1.25 lb. coke base box. * COKES: 1.50-lb. add 25c. **ELECTRO: 0.50-lb. add 25c; 0.75-lb. add 65c; 1.00-lb. add \$1.00. Differ- ential 1.00 lb. 0.25 lb. add 65c.		
	Claymont, Del.												
	Coatesville, Pa.												
	Conshohocken, Pa.	5.15 A2	6.325 A2				7.575 A2						
	Harrisburg, Pa.												
	Hartford, Conn.												
	Johnstown, Pa.								6.40 B3				
	Fairless, Pa.	5.15 U1	6.325 U1				7.575 U1	9.325 U1			\$10.50 U1	\$9.20 U1	
	New Haven, Conn.												
	Phoenixville, Pa.												
Sparrows Pt., Md.	5.10 B3	6.275 B3	6.875 B3			7.525 B3	9.275 B3	10.025 B3	6.50 B3	\$10.40 B3	\$9.10 B3		
Worcester, Mass.									6.70 A5				
Trenton, N. J.													
MIDDLE WEST	Alton, Ill.									6.60 L1			
	Ashland, Ky.	5.10 A7		6.875 A7	6.775 A7		7.525 A7						
	Canton-Massillon, Dover, Ohio			6.875 R1, R3									
	Chicago, Joliet, Ill.	5.10 W8, A1					7.525 U1, W8			6.40 A5, R1, W8			
	Sterling, Ill.									6.50 N4, K2			
	Cleveland, Ohio	5.10 R3, J3	6.275 R3, J3	7.65 R3*	6.775 R3		7.525 R3, J3	9.275 R3, J3		6.40 A5			
	Detroit, Mich.	5.10 G3, M2	6.275 G3, M2				7.525 G3	9.275 G3					
	Newport, Ky.	5.10 A1	6.275 A1										
	Gary, Ind. Harbor, Indiana	5.10 U1, I3, Y1	6.275 U1, I3, Y1	6.875 U1, I3	6.775 U1, I3, Y1	7.225 U1	7.525 U1, Y1, I3	9.275 U1, Y1		6.40 Y1	\$10.40 U1, Y1	\$9.10 J3, U1, Y1	7.85 U1, Y1
	Granite City, Ill.	5.20 G2	6.375 G2	6.975 G2	6.875 G2							\$9.20 G2	7.95 G2
Kokomo, Ind.			6.975 C9						6.50 C9				
Mansfield, Ohio	5.10 E2	6.275 E2			7.225 E2								
Middletown, Ohio		6.275 A7	6.875 A7	6.775 A7	7.225 A7								
Niles, Warren, Ohio; Sharon, Pa.	5.10 R3, S1	6.275 R3	6.875 R3 7.65 R3*	6.775 S1	7.225 S1*, R3	7.525 R3, S1	9.275 R3,				\$9.10 R3		
Pittsburgh, Midland, Butler, Donora, Aliquippa, McKeesport, Pa.	5.10 U1, J3, P6	6.275 U1, J3, P6	6.875 U1, J3 7.50 E3*	6.775 U1		7.525 U1, J3	9.275 U1, J3	10.025 U1, J3	6.40 A5, J3, P6	\$10.40 W5, J3	\$9.10 U1, J3	7.85 U1, J3	
Portsmouth, Ohio	5.10 P7	6.275 P7							6.40 P7				
Weirton, Wheeling, Follinsbee, W. Va.	5.10 W3, W5	6.275 W3, F3, W5	6.875 W3, W5 7.50 W3*		7.225 W3, W5	7.525 W3	9.275 W3			\$10.40 W5, W3	\$9.10 W5, W3	7.85 W5	
Youngstown, Ohio	5.10 U1, Y1	6.275 Y1	7.50 J3*	6.775 Y1		7.525 Y1	9.275 Y1		6.40 Y1				
WEST	Fontana, Cal.	5.825 K1	7.40 K1				8.25 K1	10.40 K1			\$11.05 K1	\$9.75 K1	
	Geneva, Utah	5.20 C7											
	Kansas City, Mo.									6.65 S2			
	Los Angeles, Torrance, Cal.									7.20 B2			
	Minnequa, Colo.									6.65 C6			
	San Francisco, Niles, Pittsburg, Cal.	5.80 C7	7.225 C7	7.625 C7						7.20 C7	\$11.05 C7	\$9.75 C7	
SOUTH	Atlanta, Ga.												
	Fairfield, Ala. Alabama City, Ala.	5.10 T2, R3	6.275 T2, R3	6.875 T2, R3	6.775 T2					6.40 T2, R3	\$10.50 T2	\$9.20 T2	
	Houston, Texas									6.65 S2			

* Electro-galvanized sheets.

(Effective Dec. 15, 1958)

* 7.425 at Sharon-Niles is 7.225

IRON AGE

STEEL
PRICES

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

STEEL PRICES		BARS						PLATES				WIRE
		Carbon Steel	Reinforcing	Cold Finished	Alloy Hot-rolled	Alloy Cold Drawn	Hi Str. H.R. Low Alloy	Carbon Steel	Floor Plate	Alloy	Hi Str. Low Alloy	Mfr's. Bright
EAST	Bethlehem, Pa.				6.725 B3	9.025 B3	8.30 B3					
	Buffalo, N. Y.	5.675 R3,B3	5.675 R3,B3	7.70 B5	6.725 B3,R3	9.025 B3,B5	8.30 B3	5.30 B3				8.00 W6
	Claymont, Del.							5.30 C4		7.50 C4	7.95 C4	
	Cottleville, Pa.							5.30 L4		7.50 L4	7.95 L4	
	Conschohocken, Pa.							5.30 A2	6.375 A2	7.50 A2	7.95 A2	
	Harrisburg, Pa.							5.30 P2	6.475 P2			
	Milton, Pa.	5.825 M7	5.825 M7									
	Hartford, Conn.			8.15 R3		9.325 R3						
	Johnstown, Pa.	5.675 B3	5.675 B3		6.725 B3		8.30 B3	5.30 B3		7.50 B3	7.95 B3	8.00 B3
	Fairless, Pa.	5.825 U1	5.825 U1		6.875 U1							
	Newark, Camden, N. J.			8.10 W10, P10		9.20 W10, P10						
	Bridgeport, Putnam, Williamantic, Conn.			8.50 W10, 8.15 J3	8.80 W8	9.175 W8						
	Sparrows Pt., Md.		5.675 B3					5.30 B3		7.50 B3	7.95 B3	8.10 B3
	Palmer, Worcester, Roadville, Mansfield, Mass.			8.20 B5, C14		9.325 A5,B5						8.30 A5, W6
	Spring City, Pa.			8.10 K4		9.20 K4						
MIDDLE WEST	Alton, Ill.	5.875 L1										8.20 L1
	Ashland,Newport,Ky.							5.30 A7, A9		7.50 A9	7.95 A7	
	Canton, Massillon, Mansfield, Ohio	6.15* R3		7.65 R3,R2	6.725 R3, 6.475 T5	9.025 R3,R2, 8.775 T5		5.30 E2				
	Chicago, Joliet, Waukegan, Madison, Harvey, Ill.	5.675 U1,R3, W8,N4,P13, 5.875 L1	5.675 U1,R3, N4,P13,W8, 5.875 L1	7.65 A5, W10,W8, B5,L2,N9	6.725 U1,R3, W8	9.025 A5, W10,W8, L2,N8,B5	8.30 U1,W8, R3	5.30 U1,A1, W8,I3	6.375 U1	7.50 U1, W8	7.95 U1, W8	8.00 A5,R3, W8,N4, K2,W7
	Cleveland, Ohio Elyria, Ohio	5.675 R3	5.675 R3	7.65 A5,C13, C18		9.025 A5, C13,C18	8.30 R3	5.30 R3,J3	6.375 J3		7.95 R3,J3	8.00 A5, C13,C18
	Detroit, Mich.	5.675 G3	5.675 G3	7.90 P3, 7.85 P8,B5, 7.65 R5	6.725 R5,G3	9.025 R3, 9.225 B5,P3, P8	8.30 G3	5.30 G3		7.50 G3	7.95 G3	
	Duluth, Minn.											8.00 A5
	Gary, Ind. Harbor, Crawfordville, Hammond, Ind.	5.675 U1,I3, Y1	5.675 U1,I3, Y1	7.65 R3,J3	6.725 U1,I3, Y1	9.025 R3,M4	8.30 U1,Y1	5.30 U1,I3, Y1	6.375 J3, I1	7.50 U1, Y1	7.95 U1, Y1,I3	8.10 M4
	Granite City, Ill.							5.40 G2				
	Kokomo, Ind.		5.775 C9									8.10 C9
	Sterling, Ill.	5.775 N4	5.775 N4					5.30 N4				8.10 K2
	Niles, Warren, Ohio Sharon, Pa.			7.65 C10	6.725 C10	9.025 C10		5.30 R3,S1		7.50 S1	7.95 R3, S1	
	Owensboro, Ky.	5.675 G5			6.725 G5							
	Pittsburgh, Midland, Donora, Aliquippa, Pa.	5.675 U1,J3	5.675 U1,J3	7.65 A5,B4, R3,J3,C11, W10,S9,C8, M9	6.725 U1,J3, C11,B7	9.025 A5, W10,R3,S9, C11,C8,M9	8.30 U1,J3	5.30 U1,J3	6.375 U1,J3	7.50 U1, J3,B7	7.95 U1, J3,B7	8.00 A5, J3,P6
	Portsmouth, Ohio											8.00 P7
Weirton, Wheeling, Fallsabee, W. Va.							5.30 W5					
Youngstown, Ohio	5.675 U1,R3, Y1	5.675 U1,R3, Y1	7.65 A1,Y1, F2	6.725 U1,Y1	9.025 Y1,F2	8.30 U1,Y1	5.30 U1, R3,Y1		7.50 Y1	7.95 U1,Y1	8.00 Y1	
WEST	Emeryville, Cal. Fontana, Cal.	6.425 J5, 6.375 K1	6.425 J5, 6.375 K1		7.775 K1		9.00 K1	6.10 K1		8.30 K1	8.75 K1	
	Geneva, Utah							5.30 C7			7.95 C7	
	Kansas City, Mo.	5.925 S2	5.925 S2		6.975 S2		8.55 S2					8.25 S2
	Los Angeles, Torrance, Cal.	6.375 C7,B2	6.375 C7,B2	9.10 R3,P14, S12	7.775 B2	11.00 P14, S12	8.625 B2					8.95 B2
	Minnequa, Colo.	6.125 C6	6.125 C6					6.15 C6				8.25 C6
	Portland, Ore.	6.425 O2	6.425 O2									
	San Francisco, Niles, Pittsburg, Cal.	6.375 C7, 6.425 B2	6.375 C7, 6.425 B2				8.675 B2					8.95 C7,C6
	Seattle, Wash.	6.425 B2,N6	6.425 B2				8.675 B2	6.20 B2		8.40 B2	8.85 B2	
	Atlanta, Ga.	5.875 A8	5.675 A8									8.00 A8
SOUTH	Fairfield City, Ala. Birmingham, Ala.	5.675 T2,R3, C16	5.675 T2,R3, C16	8.25 C16			8.30 T2	5.30 T2,R3			7.95 T2	8.00 T2,R3
	Houston, Ft. Worth, Lone Star, Texas	5.925 S2	5.925 S2		6.975 S2		8.55 S2	5.40 S2		7.60 S2	8.05 S2	8.25 S2

† Merchant Quality—Special Quality 85¢ higher.

(Effective Dec. 15, 1958)

* Special Quality.

STEEL PRICES

Key to Steel Producers

With Principal Offices

- A1 Acme Steel Co., Chicago
A2 Alan Wood Steel Co., Conshohocken, Pa.
A3 Allegheny Ludlum Steel Corp., Pittsburgh
A4 American Cladmetals Co., Carnegie, Pa.
A5 American Steel & Wire Div., Cleveland
A6 Angel Nail & Chaplet Co., Cleveland
A7 Armco Steel Corp., Middletown, Ohio
A8 Atlantic Steel Co., Atlanta, Ga.
A9 Acme-Newport Steel Co., Newport, Ky.
B1 Babcock & Wilcox Tube Div., Beaver Falls, Pa.
B2 Bethlehem Pacific Coast Steel Corp., San Francisco
B3 Bethlehem Steel Co., Bethlehem, Pa.
B4 Blair Strip Steel Co., New Castle, Pa.
B5 Bliss & Laughlin, Inc., Harvey, Ill.
B6 Brook Plant, Wickwire-Spencer Steel Div., Birdsboro, Pa.
B7 A. M. Byers, Pittsburgh
B8 Braburn Alloy Steel Corp., Braburn, Pa.
C1 Calstrip Steel Corp., Los Angeles
C2 Carpenter Steel Co., Reading, Pa.
C4 Claymont Products Dept., Claymont, Del.
C6 Colorado Fuel & Iron Corp., Denver
C7 Columbia Geneva Steel Div., San Francisco
C8 Columbia Steel & Shifting Co., Pittsburgh
C9 Continental Steel Corp., Kokomo, Ind.
C10 Copperweld Steel Co., Pittsburgh, Pa.
C11 Crucible Steel Co. of America, Pittsburgh
C13 Cuyahoga Steel & Wire Co., Cleveland
C14 Compressed Steel Shifting Co., Readville, Mass.
C15 G. O. Carlson, Inc., Thorndale, Pa.
C16 Connors Steel Div., Birmingham
C18 Cold Drawn Steel Plant, Western Automatic Machine Screw Co., Elyria, O.
D1 Detroit Steel Corp., Detroit
D3 Driver Harris Co., Harrison, N. J.
D4 Dickson Weatherproof Nail Co., Evanston, Ill.
E1 Eastern Stainless Steel Corp., Baltimore
E2 Empire-Reeves Steel Corp., Mansfield, O.
E3 Enamel Products & Plating Co., McKeesport, Pa.
F1 Firth Sterling, Inc., McKeesport, Pa.
F2 Fitzsimons Steel Corp., Youngstown
F3 Follanbee Steel Corp., Follanbee, W. Va.

- G2 Granite City Steel Co., Granite City, Ill.
G3 Great Lakes Steel Corp., Detroit
G4 Greer Steel Co., Dover, O.
G5 Green River Steel Corp., Owenboro, Ky.
H1 Hanna Furnace Corp., Detroit
H2 Ingersoll Steel Div., Chicago
H3 Inland Steel Co., Chicago
H4 Interlake Iron Corp., Cleveland
J1 Jackson Iron & Steel Co., Jackson, O.
J2 Jessop Steel Corp., Washington, Pa.
J3 Jones & Laughlin Steel Corp., Pittsburgh
J4 Joslyn Mfg. & Supply Co., Chicago
J5 Judson Steel Corp., Emeryville, Calif.
K1 Kaiser Steel Corp., Fontana, Calif.
K2 Keystone Steel & Wire Co., Peoria
K3 Koppers Co., Granite City, Ill.
K4 Keystone Drawn Steel Co., Spring City, Pa.
L1 Laclede Steel Co., St. Louis
L2 La Salle Steel Co., Chicago
L3 Lone Star Steel Co., Dallas
L4 Lukens Steel Co., Coatesville, Pa.
M1 Mahoning Valley Steel Co., Niles, O.
M2 McLouth Steel Corp., Detroit
M3 Mercer Tube & Mfg. Co., Sharon, Pa.
M4 Mid States Steel & Wire Co., Crawfordsville, Ind.
M6 Mystic Iron Works, Everett, Mass.
M7 Milton Steel Products Div., Milton, Pa.
M8 Mill Strip Products Co., Evanston, Ill.
M9 Moltrup Steel Products Co., Beaver Falls, Pa.
N1 National Supply Co., Pittsburgh
N2 National Tube Div., Pittsburgh
N4 Northwestern Steel & Wire Co., Sterling, Ill.
N6 Northwest Steel Rolling Mills, Seattle
N7 Newman Crosby Steel Co., Pawtucket, R. I.
N8 Carpenter Steel of New England, Inc., Bridgeport, Conn.
N9 Nelson Steel & Wire Co.
O1 Oliver Iron & Steel Co., Pittsburgh
O2 Oregon Steel Mills, Portland
P1 Page Steel & Wire Div., Monessen, Pa.
P2 Phoenix Iron & Steel Co., Phoenixville, Pa.
P3 Pilgrim Drawn Steel Div., Plymouth, Mich.
P4 Pittsburgh Coke & Chemical Co., Pittsburgh
P5 Pittsburgh Screw & Bolt Co., Pittsburgh
P6 Pittsburgh Steel Co., Pittsburgh
P7 Portsmouth Div., Detroit Steel Corp., Detroit

- P8 Plymouth Steel Co., Detroit
P9 Pacific States Steel Co., Niles, Cal.
P10 Precision Drawn Steel Co., Camden, N. J.
P11 Production Steel Strip Corp., Detroit
P13 Phoenix Mfg. Co., Joliet, Ill.
P14 Pacific Tube Co.
P15 Philadelphia Steel and Wire Corp.
R2 Reliance Div., Eaton Mfg. Co., Massillon, O.
R3 Republic Steel Corp., Cleveland
R4 Roebeling Sons Co., John A., Trenton, N. J.
R5 Jones & Laughlin Steel Corp., Stainless and Strip Div.
R6 Rodney Metals, Inc., New Bedford, Mass.
R7 Rome Strip Steel Co., Rome, N. Y.
S1 Sharon Steel Corp., Sharon, Pa.
S2 Sheffield Steel Div., Kansas City
S3 Shenango Furnace Co., Pittsburgh
S4 Simonds Saw and Steel Co., Fitchburg, Mass.
S5 Sweet's Steel Co., Williamsport, Pa.
S7 Stanley Works, New Britain, Conn.
S8 Superior Drawn Steel Co., Monaca, Pa.
S9 Superior Steel Div. of Copperweld Steel Co., Carnegie, Pa.
S10 Seneca Steel Service, Buffalo
S11 Southern Electric Steel Co., Birmingham
S12 Sierra Drawn Steel Corp., Los Angeles, Calif.
T1 Tonaunda Iron Div., N. Tonaunda, N. Y.
T2 Tennessee Coal & Iron Div., Fairfield
T3 Tennessee Products & Chem. Corp., Nashville
T4 Thomas Strip Div., Warren, O.
T5 Timken Steel & Tube Div., Canton, O.
T7 Texas Steel Co., Fort Worth
T8 Thompson Wire Co., Boston
U1 United States Steel Corp., Pittsburgh
U2 Universal-Cyclops Steel Corp., Bridgeville, Pa.
U3 Ulbrich Stainless Steels, Wallingford, Conn.
U4 U. S. Pipe & Foundry Co., Birmingham
W1 Wallingford Steel Co., Wallingford, Conn.
W2 Washington Steel Corp., Washington, Pa.
W3 Weirton Steel Co., Weirton, W. Va.
W4 Wheatland Tube Co., Wheatland, Pa.
W5 Wheeling Steel Corp., Wheeling, W. Va.
W6 Wickwire Spencer Steel Div., Buffalo
W7 Wilson Steel & Wire Co., Chicago
W8 Wisconsin Steel Div., S. Chicago, Ill.
W9 Woodward Iron Co., Woodward, Ala.
W10 Wyckoff Steel Co., Pittsburgh
W12 Wallace Barnes Steel Div., Bristol, Conn.
Y1 Youngstown Sheet & Tube Co., Youngstown, O.

PIPE AND TUBING

Base discounts (pct) L.o.b. mills. Base price about \$200 per net ton.

STANDARD T. & C.	BUTTWELD												SEAMLESS											
	1/2 In.		3/4 In.		1 In.		1 1/4 In.		1 1/2 In.		2 In.		2 1/2 In.		3 In.		3 1/2 In.		4 In.		4 1/2 In.		5 In.	
	Bk.	Gal.	Bk.	Gal.	Bk.	Gal.	Bk.	Gal.	Bk.	Gal.	Bk.	Gal.	Bk.	Gal.	Bk.	Gal.	Bk.	Gal.	Bk.	Gal.	Bk.	Gal.	Bk.	Gal.
Sparrows Pl. B3	0.25	*15.0	3.25	*11.0	6.75	*8.50	9.25	*5.75	9.75	*4.75	10.25	*4.25	11.75	*4.50										
Youngstown R3	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50										
Fontana K1	*10.75	*26.00	*7.75	*22.00	*4.25	*17.50	*1.75	*16.75	*1.25	*15.75	*0.75	*15.25	0.75	*15.50										
Pittsburgh J3	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50	*12.25	*27.25	*5.75	*22.50	*3.25	*28.0	*1.75	*18.50		
Alton, Ill. L1	0.25	*15.0	3.25	*11.0	6.75	*8.50	9.25	*5.75	9.75	*4.75	10.25	*4.25	11.75	*4.50										
Sharon M1	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50										
Pittsburgh N1	0.25	*15.0	3.25	*11.0	6.75	*8.50	9.25	*5.75	9.75	*4.75	10.25	*4.25	11.75	*4.50										
Wheeling W5	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50	*12.25	*27.25	*5.75	*22.50	*3.25	*28.0	*1.75	*18.50		
Wheatland W4	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50										
Youngstown Y1	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50	*12.25	*27.25	*5.75	*22.50	*3.25	*28.0	*1.75	*18.50		
Indiana Harbor Y1	1.25	*14.0	4.25	*10.0	7.75	*5.50	10.25	*4.75	10.75	*3.75	11.25	*3.25	12.75	*3.50										
Lorain N2	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50	*12.25	*27.25	*5.75	*22.50	*3.25	*28.0	*1.75	*18.50		
EXTRA STRONG PLAIN ENDS																								
Sparrows Pl. B3	4.75	*9.0	8.75	*5.0	11.75	*0.50	12.25	*1.75	12.75	*0.75	13.25	*0.25	13.75	*1.50										
Youngstown R3	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50										
Fairless N2	4.75	*9.0	8.75	*5.0	11.75	*0.50	12.25	*1.75	12.75	*0.75	13.25	*0.25	13.75	*1.50										
Fontana K1	*6.25	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	*10.75	*24.75	*3.25	*19.0	*0.75	*16.50	4.25	*11.50		
Pittsburgh J3	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50										
Alton, Ill. L1	4.75	*9.0	8.75	*5.0	11.75	*0.50	12.25	*1.75	12.75	*0.75	13.25	*0.25	13.75	*1.50										
Sharon M1	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50										
Pittsburgh N1	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	*10.75	*24.75	*3.25	*19.0	*0.75	*16.50	4.25	*11.50		
Wheeling W5	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50										
Wheatland W4	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50										
Youngstown Y1	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	*10.75	*24.75	*3.25	*19.0	*0.75	*16.50	4.25	*11.50		
Indiana Harbor Y1	5.75	*8.0	9.75	*4.0	12.75	0.50	13.25	*0.75	13.75	0.25	14.25	0.75	14.75	*0.50										
Lorain N2	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	*10.75	*24.75	*3.25	*19.0	*0.75	*16.50	4.25	*11.50		

Threads only, butt weld and seamless, 2 1/2 pt. higher discount. Plain ends, butt weld and seamless, 3-in. and under, 5 1/2 pt. higher discount.
Galvanized discounts based on zinc price range of over 9¢ to 11¢ per lb. East St. Louis. For each 2¢ change in zinc, discounts vary as follows: 1/2, 3/4 and 1-in., 2 pt.; 1 1/4, 1 1/2 and 2-in., 1 1/2 pt.; 2 1/2 and 3-in., 1 pt., e.g., zinc price range of over 13¢ to 15¢ would lower discounts on 2 1/2 and 3-in. pipe by 2 points; zinc price in range over 7¢ to 9¢ would increase discounts. East St. Louis zinc price now 11.50¢ per lb.

(Effective Dec. 15, 1958)

TOOL STEEL

F.o.b. mill	W	Cr	V	Mo	Co	per lb	SAE
18	4	1	—	—	—	\$1.84	T-1
18	4	1	—	—	—	2.545	T-2
18	4	2	—	—	—	2.005	T-2
1.5	4	1.5	8	—	—	1.20	M-1
6	4	2	—	—	—	1.50	M-3
6	4	2	—	—	—	1.345	M-2
High-carbon chromium	—	—	—	—	—	.965	D-3, D-5
Oil hardened manganese	—	—	—	—	—	.505	O-2
Special carbon	—	—	—	—	—	.38	W-1
Extra carbon	—	—	—	—	—	.38	W-1
Regular carbon	—	—	—	—	—	.325	W-1
Warehouse prices on and east of Mississippi are 4¢ per lb higher. West of Mississippi, 6¢ higher.							

CLAD STEEL

Base prices, cents per lb f.o.b.

Cladding	Plate (L4, C4, A3, J2)			Sheet (12)
	10 pct	15 pct	20 pct	
302				37.50
304	28.00	31.55	34.30	40.00
316	42.20	46.25	50.25	58.75
321	34.50	37.75	41.05	47.25
347	40.90	44.65	48.55	57.00
405	24.60	26.90	29.25	
410	22.70	24.85	27.00	
430	23.45	25.65	27.90	

CR Strip (S8) Copper, 10 pct, 2 sides, 38.75; 1 side, 33.10.

RAILS, TRACK SUPPLIES

F.o.b. Mill Cents Per Lb	No. 1 Std. Rails	Light Rails	Joint Bars	Track Spikes	Tie Plates	Track Bolts Untreated
Bessemer U1	5.75	6.725	7.25			15.35
Cleveland R3						
Sa. Chicago R3						
Enaley T2	5.75	6.725		10.10		6.875
Fairfield T2						
Gary U1	5.75		6.50			6.875
Huntington C16						
Ind. Harbor J3						
Johnstown B3		6.725		10.10		6.875
Joliet U1			7.25			
Kansas City S2				10.10		15.35
Lackawanna B3	5.75	6.725	7.25		6.875	
Lebanon B3			7.25			15.35
Minnequa C6	5.75	7.225	7.25	10.10	6.875	15.35
Pittsburgh P5						14.75
Pittsburgh J3					10.10	
Seattle B2						6.75 15.85
Steele B3	5.75		7.25		6.875	
Struthers Y1				10.10		
Terrace C7						6.75
Williamsport S5		6.50				
Youngstown R3				10.10		

COKE

Furnace, beehive (f.o.b.)	Net-Ton
Connellsville, Pa.	\$14.50
Foundry, beehive (f.o.b.)	\$18.00 to \$18.50
Foundry oven coke	
Buffalo, del'd	\$31.75
Detroit, f.o.b.	30.50
New England, del'd	31.55
Kearney, N. J., f.o.b.	29.75
Philadelphia, f.o.b.	29.50
Swedeland, Pa., f.o.b.	29.50
Painesville, Ohio, f.o.b.	30.50
Erie, Pa., f.o.b.	30.50
Cleveland, del'd	32.65
Cincinnati, del'd	31.84
St. Paul, f.o.b.	29.75
St. Louis, f.o.b.	31.50
Birmingham, f.o.b.	28.85
Milwaukee, f.o.b.	30.50
Neville, Is., f.o.b.	29.25

LAKE SUPERIOR ORES

51.50% Fe natural content, delivered lower Lake ports. Prices for 1958 season. Freight changes for seller's account.

Gross Ton	Net-Ton
Openhearth lump	\$12.70
Old range, bessemer	11.85
Old range, nonbessemer	11.70
Mesabi, bessemer	11.60
Mesabi, nonbessemer	11.45
High phosphorus	11.45

ELECTRICAL SHEETS

22-Gage F.o.b. Mill Cents Per Lb	Hot-Rolled (Cut Lengths)*	Cold-Reduced (Coiled or Cut Length)	
		Semi-Processed	Fully Processed
Field		9.875	
Armature	11.70	11.20	11.70
Elect.	12.40	11.90	12.40
Special Motor		12.475	
Motor	13.55	13.05	13.55
Dynamo	14.65	14.15	14.65
Trans. 72	15.70	15.20	15.70
Trans. 65	16.30		
Grain Oriented			
Trans. 58	16.80	Trans. 80	19.70
Trans. 52	17.85	Trans. 73	29.20
		Trans. 66	30.70

Producing points: Neesh Bottom (W5); Brackenridge (A3); Granite City (G2); Indiana Harbor (J3); Mansfield (E2); Newport, Ky. (A9); Niles, O. (S1); Vandergrift (U1); Warren, O. (R3); Zanesville, Butler (A7).

ELECTRODES

Cents per lb. f.o.b. plant, threaded, with nipples, unboxed.

GRAPHITE			CARBON*		
Diam. (in.)	Length (in.)	Price	Diam. (in.)	Length (in.)	Price
24	84	27.25	40	100, 110	12.50
20	72	26.50	35	110	11.20
18	72	27.50	30	110	11.70
14	72	27.25	24	72	11.95
12	72	28.25	20	90	11.55
10	60	29.50	17	72	12.10
10	48	30.00	14	72	12.55
7	60	29.75	10	60	13.80
6	60	32.25	8	60	14.25
4	40	37.00			
3	40	39.25			
2½	30	41.50			
2	24	64.00			

* Prices shown cover carbon nipples.

REFRACTORIES

Fire Clay Brick

Super duty, Mo., Pa., Md., Ky.	Carloads per 1000
High duty (except Salina, Pa., add \$5.00)	140.00
Medium duty	125.00
Low duty (except Salina, Pa., add \$2.00)	103.00
Ground fire clay, net ton, bulk	22.50

Silica Brick

Mt. Union, Pa., Ensley, Ala.	\$158.00
Childs, Hays, Latrobe, Pa.	163.00
Chicago District	168.00
Western Utah	183.00
California	165.00
Super Duty	
Hays, Pa., Athens, Tex., Windham, Warren, O., Morrisville	163.00-168.00
Silica cement, net ton, bulk, Latrobe	29.75
Silica cement, net ton, bulk, Chicago	26.75
Silica cement, net ton, bulk, Ensley, Ala.	27.75
Silica cement, net ton, bulk, Mt. Union	25.75
Silica cement, net ton, bulk, Utah and Calif.	39.00

Chrome Brick

Standard chemically bonded, Balt.	Per net ton
Standard chemically bonded, Curt-Iner, Calif.	\$109.00
Burned, Balt.	119.00
	103.00

Magnesite Brick

Standard, Baltimore	\$140.00
Chemically bonded, Baltimore	119.00

Grain Magnesite

St. ¾ to ½-in. grains	
Domestic, f.o.b. Baltimore in bulk	\$73.00
Domestic, f.o.b. Chewelah, Wash., Luning, Nev.	
in bulk	46.00
in sacks	\$2.00-54.00

Dead Burned Dolomite

Standard, Baltimore	Per net ton
F.o.b. bulk, producing points in:	
Pa., W. Va., Ohio	\$16.75
Missouri Valley	15.00
Midwest	17.00

(Effective Dec. 15, 1958)

MERCHANT WIRE PRODUCTS

F.o.b. Mill	Standard Q Coated Nails	Woven Wire Fence	1/2" Fence Posts	Single Loop Barb Ties	Gale, Barbed and Twisted Barbless Wire	March Wire Ann'd	Merch. Wire Galv.
	Cal	Cal	Cal	Cal	Cal	e/lb.	e/lb.
Alabama City R3	173	187		212 193		9.00 9.55	
Aitiquipa J3**	173	190		214 198		9.00 9.475	
Atlanta A8**	175	192		214 198		9.10 9.775	
Bartonville K2**	175	192		214 198		9.00 9.55	
Buffalo W8						9.00 9.55	
Chicago N4**	173	190		212 196		9.00 9.325	
Chicago R3						9.00 9.55	
Cleveland A6						9.00	
Cleveland A5						9.00	
Crawford M4**	175	192		214 198		9.10 9.775	
Donora, Pa. A5	173	187		212 193		9.00 9.55	
Duluth A5	173	187		212 193		9.00 9.55	
Fairfield, Ala. T2	173	187		212 193		9.00 9.55	
Galveston D4	9.10						
Houston S2	173	192		212 198		9.25 9.801	
Jacksonville M4	184-1	197		219 203		9.10 9.775	
Johnstown B3**	173	190		212 193		9.00 9.675	
Joliet, Ill. A5	173	187		212 193		9.00 9.55	
Kokomo C9	175	180		214 195*		9.10 9.65	
L. Angeles B2**						9.55 10.625	
Kansas City S2*	178	192		217 198*		9.25 9.801	
Minnequa C6	178	192		212 198*		9.25 9.801	
Monroeville P6						9.65 9.325	
Palmer, Mass. W6						9.30 9.85	
Pittsburg, Cal. C7	192	210		213		9.60 10.15	
Rankin, Pa. A5	173	187		213		9.00 9.55	
Sa. Chicago R3	173	187		213		9.00 9.55	
S. San Fran. C6						9.10 9.501	
St. Louis P6**	175			214 198		9.10 9.775	
Struthers, O. Y1*						9.65 9.20	
Worcester A5	179					9.30 9.85	
Williamsport S5							

* Zinc less than .10%. ** 11-12¢ zinc. *** 10¢ zinc. † Plus zinc extras. ‡ Wholesalers only.

C-R SPRING STEEL

Cents Per Lb F.o.b. Mill	CARBON CONTENT				
	0.26-0.40	0.41-0.60	0.61-0.80	0.81-1.05	1.06-1.35
Anderson, Ind. C4	8.95 10.40	12.60	15.60	18.55	
Baltimore, Md. T8	9.50 10.70	12.90	15.90	18.85	
Bristol, Conn. W12	9.50 10.70	12.90	15.90	18.85	
Boston T8	9.50 10.70	12.90	15.90	18.85	
Buffalo, N. Y. R7	8.95 10.40	12.60	15.60	18.55	
Carnegie, Pa. S9	8.95 10.40	12.60	15.60	18.55	
Cleveland A5	8.95 10.40	12.60	15.60	18.55	
Dearborn S1	9.05 10.50	12.70	15.70		
Detroit D1	9.05 10.50	12.70	15.70		
Detroit D2	9.05 10.50	12.70	15.70		
Dover, O. C4	8.95 10.40	12.60	15.60	18.55	
Eranson, Ill. M8	9.05 10.40	12.60	15.60	18.55	
Franklin Park, Ill. T8	9.05 10.40	12.60	15.60	18.55	
Harrison, N. J. C11	9.05 10.40	12.60	15.60	18.55	
Indianapolis R5	9.10 10.55	12.60	15.60	18.55	
Los Angeles C1	11.15 12.60	14.80	17.80		
New Britain, Conn. S7	9.40 10.70	12.90	15.90	18.85	
New Castle, Pa. B4	8.95 10.40	12.60	15.60	18.55	
New Haven, Conn. D1	9.40 10.70	12.90	15.90	18.85	
Pawtucket, R. I. N7	9.50 10.70	12.90	15.90	18.85	
Riverdale, Ill. A1	9.05 10.40	12.60	15.60	18.55	
Sharon, Pa. S1	8.95 10.40	12.60	15.60	18.55	
Trenton, R4	10.70 12.90	16.10	19.30		
Wallingford W1	9.40 10.70	12.90	15.90	18.85	
Warren, Ohio T4	8.95 10.40	12.60	15.60	18.55	
Worcester, Mass. A5	9.50 10.70	12.90	15.90	18.85	
Youngstown R5	9.10 10.55	12.60	15.60	18.55	

BOILER TUBES

5 per 100 lb. carload lots cut 10 to 24 ft. F.a.b. Mill	Size		Seamless		Elec. Weld
	OD-In.	B.W. G.	H.R.	C.D.	H.R.
Babcock & Wilcox	2	13	40.28	47.21	35.22
	2½	12	54.23	63.57	47.43
	3	12	62.62	73.40	54.77
	3½	11	73.11	85.70	63.93
	4	10	97.08	113.80	85.53
National Tube	2	13	40.28	47.21	35.22
	2½	12	54.23	63.57	47.43
	3	12	62.62	73.40	54.77
	3½	11	73.11	85.70	63.93
	4	10	97.08	113.80	85.53
Pittsburgh Steel	2	13	40.28	47.21	35.22
	2½	12	54.23	63.57	47.43
	3	12	62.62	73.40	54.77
	3½	11	73.11	85.70	63.93
	4	10	97.08	113.80	85.53

METAL POWDERS

Cents per lb, minimum truckload, delivered E. of Miss. River, unless otherwise noted.

Iron Powders

Compacting Powders

Electrolytic, imported, f.o.b.	29.50 to 33.00
Electrolytic, domestic	34.50
Sponge	11.25
Atomized	11.25
Hydrogen Reduced	11.25 to 12.00
Carbonyl	88.00

Welding Powders	8.10
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Cutting and Scarfing Powders	9.10
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Copper Powders

Electrolytic, domestic	41.00
Precipitated	40.50 to 45.00
Atomized	39.80 to 48.30
Hydrogen reduced, f.o.b.	43.25
Bronze	47.20 to 51.50
Chromium, electrolytic	19.00
Lead	42.00
Manganese, f.o.b.	\$3.60 to \$3.95
Molybdenum	\$1.05 to \$1.03
Nickel	53.50
Nickel Silver	13.00
Nickel Steel	13.00
Solder	13¢ plus metal value
Stainless Steel, 302	\$1.07
Stainless Steel, 316	\$1.26
Steel, atomized, prealloyed, 4600 series	14.00 plus metal value
Tin	14¢ plus metal value
Titanium, 99.25+%, per lb., f.o.b.	\$11.25
Tungsten	\$3.15 (nominal)

BOLTS, NUTS, RIVETS, SCREWS

(Base discount, f.o.b. mill)

Pct. Discounts

Units	1-4 Containers	5 Containers	20,000 Lb.	40,000 Lb.
Machine				
1/4" and smaller x 3" and shorter	55	57	61	62
1/2" diam. x 3" and shorter	47	49 1/2	54	55
3/4" thru 1" diam x 3" and shorter	37	39 1/2	45	46
1/2" thru 1" diam. longer than 6" and 1 1/2" and larger x all lengths	31	34	40	41
1 1/2" and larger x 3" and shorter	55	57	61	62
Carriage, lag, plow, tap, blank, step, elevator and fitting up bolts 1/2" and smaller x 6" and shorter	48	50 1/2	55	56

Note: Add 25 pct for less than container quantity. Distributor prices are 5 pct less on bolts and square nuts.

Nuts, Hex, HP reg. & hvy.

Full case or Keg price

1/2 in. or smaller	62
3/4 in. to 1 1/2 in. inclusive	56
1 1/2 in. and larger	51 1/2

C. P. Hex, reg. & hvy.

1/2 in. or smaller	62
3/4 in. to 1 1/2 in. inclusive	56
1 1/2 in. and larger	51 1/2

Hot Galv. Hex Nuts (All Types)

1/2 in. and smaller	41
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Semi-finished Hex Nuts

1/2 in. or smaller	62
3/4 in. to 1 1/2 in. inclusive	56
1 1/2 in. and larger	51 1/2

(Add 25 pct for broken case or keg quantities)

Finished

1/2 in. and smaller	65
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Rivets

Base per 100 lb

1/2 in. and larger	\$12.85
7/16 in. and smaller	15

Cap Screws

Discount (Packages)

Full Finished H. C. Heat Treat	
New std. hex head, packaged	Full Case

1/2" diam. and smaller x 6" and shorter	54	42
3/4", 1", and 1 1/2" diam. x 6" and shorter	38	23
1/2" diam. and smaller x longer than 6"
3/4", 1", and 1 1/2" diam. x longer than 6"

C-1018 Steel Full-Finished Carbons Bulk

1/2" through 5/8" dia. x 6" and shorter	59	48
3/4" through 1" dia. x 6" and shorter	45	32
Minimum quantity—1/4" through 5/8" diam., 15,000 pieces; 7/16" through 3/4" diam., 5,000 pieces; 3/4" through 1" diam., 2,000 pieces.		

Machine Screws & Stove Bolts

	Discount	Mach. Screws	Stove Bolts
Plain Finish			
Cartons	60		
Bulk			
To 1/4" diam.	Quantity		
1/4" thru 5/16" diam.	25,000-and over	60	..
5/16" to 1/2" diam.	15,000-200,000	60	..
Incl.			

Machine Screws & Stove Bolt Nuts

	Discount	Hex	Square
In Cartons		16	19
In Bulk			
1/2" diam. & smaller	Quantity		
1/2" and over	25,000-and over	15	16

STEEL SERVICE CENTERS

Metropolitan Price, dollars per 100 lb.

Cities	City Delivery & Charge	Sheets		Strip	Plates	Shapes	Bars		Alloy Bars				
		Hot-Rolled (16 ga. & brv.)	Cold-Rolled (15 gage)	Galvanized (10 gage) (†)	Hot-Rolled	Standard Structural	Hot-Rolled (merchant)	Cold- Finished	Hot-Rolled 4015 As rolled	Hot-Rolled 4110 Annealed	Cold-Drawn 4015 As rolled	Cold-Drawn Annealed	
Atlanta		8.58	9.87	10.13	8.91	9.29	9.40	9.38	13.24*				
Baltimore	\$.10	8.65	9.35	9.09	9.15	9.10	9.65	9.55	11.80*	16.28	15.28	19.82	19.88
Birmingham		8.18	9.45	10.46	8.51	8.89	9.00	8.99					
Boston	.10	9.41	10.50	11.49	9.84	10.12	10.11	10.21	13.45*	16.79	15.79	20.29	19.56
Buffalo	.15	8.40	9.75	11.00	8.90	9.35	9.40	9.30	11.60*	16.34	15.35	19.81	19.30
Chicago	.15	8.40	9.60	10.65	8.66	9.04	9.15	9.14	9.30	16.20	15.20	19.70	18.95
Cincinnati	.15	8.58	9.65	10.70	8.98	9.42	9.71	9.46	11.68*	16.52	15.52	20.02	19.27
Cleveland	.15	8.51	9.60	10.80	8.78	9.28	9.54	9.25	11.40*	16.31	15.31	19.81	19.06
Denver	.20	9.60	11.84	12.94	9.63	9.96	10.04	10.00	11.19				20.84
Detroit	.15	8.46	9.85	11.02	9.03	9.41	9.71	9.45	9.66	15.46	15.48	18.81	19.23
Houston		8.10	8.60		8.15	8.45	8.05	8.18	10.60	16.20	15.25	19.65	18.95
Kansas City	.15	9.02	10.27	11.37	9.33	9.71	9.82	9.81	10.22	16.87	15.87	20.37	19.62
Los Angeles		8.70*	11.20- 11.80	12.20	9.15	9.10	9.00	9.10	12.95	17.30	16.35	21.30	20.60
Memphis	.15	8.55	9.60		8.60	8.93	9.01	8.97	12.11*				
Milwaukee	.15	8.54	9.73	10.79	8.60	9.13	9.37	9.28	9.54	16.34	15.34	19.84	19.09
New York	.10	8.97	10.23	11.20	9.74	9.87	9.84	10.09	13.35*	16.16	15.60	20.10	19.35
Norfolk	.20	8.28			8.50	8.65	9.20	8.90	10.70				
Philadelphia	.10	8.30	9.35	10.44	9.35	9.25	9.20	9.50	12.05*	16.58	15.58	20.08	19.33
Pittsburgh	.15	8.50- 8.60	9.70- 9.95	11.05	8.76	9.05	9.15	9.14	11.40*	16.20	15.20	19.70	18.95
Portland		10.00*	11.75*	13.30*	11.95*	11.50*	11.10*	9.85*	15.30*	16.50	17.45	20.75	20.25
San Francisco	.10	9.75	11.20	11.40	9.85	10.10	9.95	10.25	13.70	17.05	16.35	21.85	20.60
Seattle		9.95	11.55	12.45	10.00	9.70	9.80	10.10	14.70	17.15	16.80	20.65	20.60
Spokane	.15	10.10	11.70	12.60	10.65	9.85	9.95	10.75	14.85	17.75	16.95	21.55	20.75
St. Louis		8.78	9.98	11.03	8.94	9.42	9.43	9.52	9.93	16.58	15.58	20.08	19.33
St. Paul	.15	8.94	10.19	10.86	8.99	9.45	9.53	9.70*	10.16		15.41		19.21

Base Quantities (Standard unless otherwise keyed): Cold finished bars: 2000 lb or over. Alloy bars: 1000 to 1999 lb. All others: 2000 to 4999 lb. All HR products may be combined for quantity. All galvanized sheets may be combined for quantity. CR sheets may be combined with each other for quantity. **All sizes except 18 and 16 gage.

†† 10¢ zinc. ‡ Deduct for country delivery. * C1018—1 in. rounds, 10 ga. x 36" x 120"; ‡ 20 ga. x 36" x 120"; ‡ 26 ga. x 30" x 96"; ‡ 4 1/2" x 1" in lots of 1000 to 9999; ‡ sheared plate 1/4" x 54" in lots of 1000 to 9999; ‡ 8" x 5.70" in lots of 1000 to 9999; ‡ M-1020—1-in. rounds in lots of 1000 to 9999; ‡ 16 ga. & heavier.

(Effective Dec. 15, 1958)

PIG IRON

Dollars per gross ton, f.o.b., subject to switching charges.

Producing Point	Basic	Fdry.	Mail.	Bess.	Low Phos.
Birdsboro, Pa. B6	68.00	68.50	69.00	69.50	
Birmingham R3	62.00	62.50			
Birmingham W9	62.00	62.50			
Birmingham U4	62.00	62.50			
Buffalo R3	66.00	66.50	67.00	67.50	
Buffalo H1	66.00	66.50	67.00	67.50	
Buffalo W6	66.00	66.50	67.00	67.50	
Chester P2	66.50	67.00	67.50		
Chicago I4	66.00	66.50	67.00	67.00	
Cleveland A5	66.00	66.50	66.50	67.00	71.00†
Cleveland R3	66.00	66.50	66.50	67.00	
Duluth I4	66.00	66.50	66.50	67.00	71.00†
Erie I4	66.00	66.50	66.50	67.00	71.00†
Everett M6	67.50	68.00	68.50		
Fontana K1	75.00	75.50			
Genova, Utah C7	66.00	66.50			
Granite City G2	67.50	68.00	68.50		
Hubbard Y1			66.50		
Ironton, Utah C7	66.00	66.50			
Midland C11	66.00				
Minnequa C6	68.00	68.50	69.00		
Monessen P6	66.00				
Neville Is. P4	66.00	66.50	66.50	67.00	71.00†
N. Tonawanda T1	66.00	66.50	67.00	67.50	
Sharpville S3	66.00	66.50	67.00	67.00	
So. Chicago R3	66.00	66.50	66.50	67.00	
So. Chicago W8	66.00	66.50	66.50	67.00	
Swedeland A2	68.00	68.50	69.00	69.50	
Teledo I4	66.00	66.50	66.50	67.00	
Troy, N. Y. R3	68.00	68.50	69.00	69.50	73.00
Youngstown Y1			66.50		

DIFFERENTIALS: Add, 75¢ per ton for each 0.25 pct silicon or portion thereof over base (1.75 to 2.25 pct except low phos., 1.75 to 2.00 pct) 50¢ per ton for each 0.25 pct manganese or portion thereof over 1 pct, \$2 per ton for 8.50 to 9.75 pct nickel, \$1 for each additional 0.25 pct nickel. Add \$1.00 for 0.31-0.60 pct phos.

Silvery Iron: Buffalo (6 pct), H1, \$79.25; Jackson J1, I4 (Globe Div.), \$78.00; Niagara Falls (15.01-15.50), \$101.00; Kokuk (14.01-14.50), \$103.50; (15.51-16.00), \$106.50. Add \$1.00 per ton for each 0.50 pct silicon over base (6.01 to 6.50 pct) up to 18 pct. Add \$1.25 for each 0.50 pct manganese over 1.00 pct. Seasonal silvery pig iron (under 10 pct phos.): \$64.00. Add \$1.00 premium for all grades silvery to 18 pct.

† Intermediate low phos.

STAINLESS STEEL

Base price cents per lb. f.o.b. mill

Product	201	202	301	302	303	304	316	321	347	403	410	416	430
Ingot, re-rolled	22.00	23.75	23.25	25.25	—	27.00	39.75	32.25	37.00	—	16.75	—	17.00
Slabs, billets	27.00	38.25	28.00	31.50	32.00	33.25	49.50	40.00	46.50	—	21.50	—	21.75
Billets, forging	—	36.50	37.25	38.00	41.00	40.50	62.25	47.00	55.75	28.25	28.25	28.75	28.75
Bars, struct.	42.00	43.00	44.25	45.00	48.00	47.75	73.00	55.50	64.75	33.75	33.75	34.25	34.25
Plates	39.25	40.00	41.25	42.25	45.00	45.75	71.75	54.75	64.75	30.00	30.00	31.25	31.00
Sheets	48.50	49.25	51.25	52.00	58.75	55.00	80.75	65.50	79.25	40.25	40.25	48.25	40.75
Strip, hot-rolled	36.00	39.00	37.25	40.50	—	44.25	69.25	53.50	63.50	—	31.00	—	32.00
Strip, cold-rolled	45.00	49.25	47.50	52.00	56.75	55.00	80.75	65.50	79.25	40.25	40.25	42.50	40.75
Wire CF; Rod HR	40.00	49.75	42.00	42.75	45.50	45.25	69.25	52.75	61.50	32.00	32.00	32.50	32.50

STAINLESS STEEL PRODUCING POINTS:

Sheets: Midland, Pa., C11; Brackenridge, Pa., A3; Butler, Pa., A7; Vandergrift, Pa., U1; Washington, Pa., W2, J2; Baltimore, El; Middletown, O., A7; Massillon, O., R3; Gary, U1; Bridgeville, Pa., U2; New Castle, Ind., I2; Detroit, M2; Louisville, O., R3.

Strip: Midland, Pa., C11; Waukegan, Cleveland, A5; Carnegie, Pa., S9; McKeesport, Pa., F1; Reading, Pa., C2; Washington, Pa., W2; W. Leeburg, Pa., A3; Bridgeville, Pa., U2; Detroit, M2; Detroit, S1; Canton, Massillon, O., R3; Harrison, N. J., D3; Youngstown, R3; Sharon, Pa., S1; Butler, Pa., A7; Wallingford, Conn., U3 (plus further conversion extra); W1 (25¢ per lb. higher); New Bedford, Mass., R6; Gary, U1 (25¢ per lb. higher).

Bar: Baltimore, A7; S. Duquesne, Pa., U1; Munhall, Pa., U1; Reading, Pa., C2; Titusville, Pa., U2; Washington, Pa., J2; McKeesport, Pa., U1, F1; Bridgeville, Pa., U2; Dunkirk, N. Y., A3; Massillon, O., R3; S. Chicago, U1; Syracuse, N. Y., C11; Watervliet, N. Y., A3; Waukegan, A5; Canton, O., T5, R3; Ft. Wayne, I4; Detroit, R3; Gary, U1; Owensboro, Ky., G5; Bridgeport, Conn., N8.

Wire: Waukegan, A5; Massillon, O., R3; McKeesport, Pa., F1; Ft. Wayne, J4; Harrison, N. J., D3; Baltimore, A7; Dunkirk, A3; Monessen, P1; Syracuse, C11; Bridgeville, U2; Detroit, R5.

Structurals: Baltimore, A7; Massillon, O., R3; Chicago, Ill., J4; Watervliet, N. Y., A3; Syracuse, C11; S. Chicago, U1.

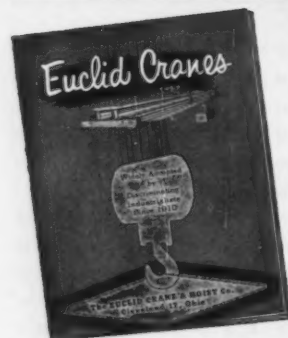
Plates: Baltimore, El; Brackenridge, Pa., A3; Chicago, U1; Munhall, Pa., U1; Midland, Pa., C11; New Castle, Ind., I2; Middletown, A7; Washington, Pa., J2; Cleveland, Massillon, R3; Coatsville, Pa., C15; Vandergrift, Pa., U1; Gary, U1.

Forging billets: Midland, Pa., C11; Baltimore, A7; Washington, Pa., J2; McKeesport, F1; Massillon, Canton, O., R3; Watervliet, A3; Pittsburgh, Chicago, U1; Syracuse, C11; Detroit, R3; Munhall, Pa., S. Chicago, U1; Owensboro, Ky., G5; Bridgeport, Conn., N8.

(Effective Dec. 15, 1958)



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FERROALLOY PRICES

Ferrochrome

Cents per lb contained Cr, lump, bulk, carloads, del'd. 67-71% Cr, 30-1.00% max. Si			
0.02% C	41.00	0.50% C	38.00
0.05% C	39.00	1.00% C	37.75
0.10% C	38.50	1.50% C	37.50
0.20% C	38.25	2.00% C	37.25
4.00-4.50% C, 60-70% Cr, 1-2% Si	28.75		
3.50-5.00% C, 57-64% Cr, 2.00-4.50% Si	28.25		
0.025% C (Simplex)	36.75		
8% max C, 50-55% Cr, 6% max Si	25.75		
4 1/2% max C, 50-55% Cr, 2% max Si	26.50		

High Nitrogen Ferrochrome

Low-carbon type 0.75% N. Add 5¢ per lb to regular low carbon ferrochrome max. 0.10% C price schedule.

Chromium Metal

Per lb chromium, contained, packed, delivered, ton lots, 97.25% min. Cr, 1% max. Fe.	
0.10% max. C	\$1.29
9 to 11% C, 88-91% Cr, 0.75% Fe	1.38

Electrolytic Chromium Metal

Per lb of metal 2" x D plate (1/4" thick) delivered packed, 99.80% min. Cr. (Metallic Base) Fe 0.20 max.	
Carloads	\$1.15
Ton lots	1.17
Less ton lots	1.19

Low Carbon Ferrochrome Silicon

(Cr 39-41%, Si 42-45%, C 0.05% max.) Carloads, delivered, lump, 3-in. x down, packed.			
Price is sum of contained Cr and contained Si.			
	Cr	Si	
Carloads, bulk	28.25	14.60	
Ton lots	33.50	16.05	
Less ton lots	35.10	17.70	

Calcium-Silicon

Per lb of alloy, lump, delivered, packed, 30-33% Cr, 60-65% Si, 3.00 max. Fe.	
Carloads, bulk	24.00
Ton lots	27.95
Less ton lots	29.45

Calcium-Manganese-Silicon

Cents per lb of alloy, lump, delivered, packed, 16-20% Ca, 14-18% Mn, 53-59% Si.	
Carloads, bulk	23.00
Ton lots	26.15
Less ton lots	27.15

SMZ

Cents per pound of alloy, delivered, 60-65% Si, 5-7% Mn, 5-7% Zr, 20% Fe 1/2 in. x 12 mesh.	
Ton lots	21.15
Less ton lots	22.40

V Foundry Alloy

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis, V-5; 38-42% Cr, 17-19% Si, 8-11% Mn, packed.	
Carload lots	18.45
Ton lots	19.95
Less ton lots	21.20

Graphidex No. 4

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis, Si 48 to 52%, Ti 9 to 11%, Ca 5 to 7%.	
Carload packed	19.20
Ton lots to carload packed	21.15
Less ton lots	22.40

Ferromanganese

Maximum base price, f.o.b., lump size, base content 74 to 76 pct Mn.

Producing Point	Cents per-lb
Marietta, Ashland, O.; Alloy, W. Va.; Sheffield, Ala.; Portland, Ore.	12.25
Johnstown, Pa.	12.25
Neville Island, Pa.	12.25
Sheridan, Pa.	12.25
Philo, Ohio	12.25
S. Duquesne	12.25
Add or subtract 0.1¢ for each 1 pct Mn above or below base content.	
Briquets, delivered, 66 pct Mn:	
Carloads, bulk	14.80
Ton lots packed in bags	17.20

Spiegeleisen

Per gross ton, lump, f.o.b. Palmerton, Pa., and Neville Island, Pa.	
Manganese Silicon	
16 to 19%	3% max. \$100.50
19 to 21%	3% max. 102.50
21 to 23%	3% max. 105.00

Manganese Metal

2 in. x down, cents per pound of metal delivered.	
85.50% min. Mn, 0.2% max. C, 1% max. Si, 2.5% max. Fe.	
Carload, packed	45.75
Ton lots	47.25

Electrolytic Manganese

F.o.b. Knoxville, Tenn., freight allowed east of Mississippi, f.o.b. Marietta, O., delivered, cents per pound.	
Carloads	34.00
Ton lots	36.00
250 to 1999 lb	38.00
Premium for Hydrogen - removed metal	0.75

Medium Carbon Ferromanganese

Mn 80 to 85%, C 1.25 to 1.50, Si 1.50% max., carloads, lump, bulk, delivered, per lb of contained Mn	
	25.50

Low-Carb Ferromanganese

Cents per pound Mn contained, lump size, packed, del'd Mn 85-90%.			
	Carloads	Ton	Less
0.07% max. C, 0.06% (Bulk)			
1, 90% Mn	37.15	39.95	41.15
0.07% max. C	35.10	37.90	39.10
0.10% max. C	34.35	37.15	38.35
0.15% max. C	33.60	36.40	37.60
0.30% max. C	32.10	34.90	36.10
0.50% max. C	31.60	34.40	35.60
0.75% max. C, 80.85% Mn, 5.0-7.0% Si	28.60	31.40	32.60

Silicomanganese

Lump size, cents per pound of metal, 65-68% Mn, 18-20% Si, 1.5% max. C for 2% max. C, deduct 0.2¢ f.o.b. shipping point.	
Carloads bulk	12.80
Ton lots, packed	14.45
Carloads, bulk, delivered, per lb of briquet	15.10
Briquets, packed pallets, 3000 lb up to carloads	16.30

Silvery Iron (electric furnace)

Si 15.50 to 16.00 pct, f.o.b. Keokuk, Iowa, or Wenatchee, Wash., \$106.50 gross ton, freight allowed to normal trade area, Si 15.01 to 15.50 pct, f.o.b. Niagara Falls, N. Y., \$93.00.	
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Silicon Metal

Cents per pound contained Si, lump size, delivered, packed.	
	Ton lots, Carloads,
98.25% Si, 0.50% Fe	24.95 23.65
98% Si, 1.0% Fe	24.45 23.15

Silicon Briquets

Cents per pound of briquets, bulk, delivered, 40% Si, 2 lb Si, briquets.	
Carloads, bulk	8.00
Ton lots, packed	10.80

Electric Ferrosilicon

Cents per lb contained Si, lump, bulk, carloads, f.o.b. shipping point.	
50% Si	14.60
65% Si	15.75
85% Si	16.90
90% Si	18.60
90% Si	20.00

Ferrovandium

50-55% V delivered, per pound, contained V, in any quantity.	
Openhearth	3.20
Crucible	3.30
High speed steel	3.40

Calcium Metal

Eastern zone, cents per pound of metal, delivered.	
	Cast Turnings Distilled
Ton lots	\$2.05 \$2.95 \$3.75
100 to 1999 lb.	2.40 3.30 4.55

(Effective Dec. 15, 1958)

Alsiifer, 20% Al, 40% Si, 40% Fe, f.o.b. Suspension Bridge, N. Y., per lb.

Carloads, bulk	9.85¢
Ton lots	11.20¢

Calcium molybdate, 43.6-46.6% f.o.b. Langeloth, Pa., per pound contained Mo

	\$1.50
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Ferrocolumbium, 50-60% lb, 2 in. x D, delivered per pound contained Cb.

Ton lots	\$3.90
Less ton lots	3.95

Ferro-tantalum-columbium, 20% Ta, 40% Cb, 0.30% C, del'd ton lots, 2-in. x D per lb con't Cb plus Ta

	\$3.40
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Ferromolybdenum, 55-75%, 200-lb containers, f.o.b. Langeloth, Pa., per pound contained Mo

	\$1.76
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Ferrophosphorus, electric, 23-26%, car lots, f.o.b. Siglo, Mt. Pleasant, Tenn., \$5.00 unitage, per gross ton

10 tons to less carload	\$120.00
	\$131.00

Ferrotitanium, 40% regular grade 0.10% C max., f.o.b. Niagara Falls, N. Y., and Cambridge, O., freight allowed, ton lots, per lb contained Ti

	\$1.35
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Ferrotitanium, 25% low carbon, 0.10% C max., f.o.b. Niagara Falls, N. Y., and Cambridge, O., freight allowed, ton lots, per lb contained Ti

	\$1.50
Less ton lots	\$1.54

Ferrotitanium, 15 to 18% high carbon, f.o.b. Niagara Falls, N. Y., freight allowed, carload per net ton

	\$240.00
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Ferrotungsten, 1/4 x down packed, per pounds contained W, ton lots delivered

	\$2.15 (nominal)
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Molybde oxide, briquets per lb contained Mo, f.o.b. Langeloth, Pa.

bags, f.o.b. Washington, Pa., Langeloth, Pa.	\$1.49
	\$1.38

Simundi, 20% Si, 20% Mn, 20% Al, f.o.b. Philo, Ohio, freight allowed per lb.

Carload, bulk lump	18.50¢
Ton lots, packed lump	20.50¢
Less ton lots	21.00¢

Vanadium oxide, 85-89% V₂O₅ per pound contained V₂O₅

	\$1.38
--	--------

Zirconium silicon, per lb of alloy 35-40% del'd, carloads, bulk, 12-15% del'd lump, bulk-carloads

	26.25¢
	9.25¢

Boron Agents

Borosil, per lb of alloy del. f.o.b. Philo, Ohio, freight allowed, B 3-4%, Si 40-45%, per lb contained B

2000 lb carload	\$5.50
-----------------	--------

Bortram, f.o.b. Niagara Falls.

Ton lots per pound	45¢
Less ton lots, per pound	50¢

Corbortam, Ti 15-21%, B 1-2%, Si 2-4%, Al 1-3%, C 4-5-7.5%, f.o.b. Suspension Bridge, N. Y., freight allowed.

Ton lots per pound	14.00¢
--------------------	--------

Ferroboron, 17.50 min. B, 1.50% max. Si, 0.50% max. Al, 0.50% max. C, 1 in. x D, ton lots.

F.o.b. Wash., Pa., Niagara Falls, N. Y., delivered 100 lb up	\$1.20
--------------------------------------------------------------	--------

10 to 14% B	.85
14 to 19% B	1.20
19% min. B	1.50

Grainsil, f.o.b. Cambridge, O., freight allowed, 100 lb and over No. 1

No. 79	\$1.05
	50¢

Manganese-Boron, 75.00% Mn, 17.50% B, 5% max. Fe, 1.50% max. Si, 3.00% max. C, 2 in. x D, del'd.

Ton lots (packed)	\$1.46
Less ton lots (packed)	1.57

Nickel-Boron, 15-18% B, 1.00% max. Al, 1.50% max. Si, 0.50% max. C, 3.00% max. Fe, balance Ni, del'd less ton lots

	2.15
--	------

REBUILT—GUARANTEED ELECTRICAL EQUIPMENT STEEL MILL SPECIALS

- (1) 2200-H.P. Westinghouse Motor, 600 V.D.C., 300/600 R.P.M.
- (1) 1250-H.P., Allis-Chalmers Motor, 600 V.D.C., 300/600 R.P.M.
- (1) S.S. 4-unit M.G. Set consists of 2500-H.P., 8 P.F. Syn. motor, 11000/4160-V., 3 ph., 60 cy. (1) 1060-K.W. Gen. 600-V.D.C. and (2) 760-K.W. 600-V.D.C. Generators, complete with exciter sets.
- (2) S.S. 645-H.P. Mill Motors, each 300-V.D.C. 1000 R.P.M. (used with above 1060-K.W. Gen.)
- (2) S.S. Reel Motors (mill type) each 940-H.P. 800/1000 R.P.M., 600-V.D.C. (used with above (2) 760-K.W. Gen.). We will sell the above complete PACKAGE or segregate it to suit your REQUIREMENTS with necessary CONTROLS.

Special, before removal (1) 1875-K.W. Whse., M.G. Set, Gen. 250-V.D.C., 514 R.P.M. with 2700-H.P. Syn. Motor, 13800/6900/4000-V., 3 ph., 60 cy. with Control.

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THE CLEARING HOUSE

Big Lathes and Mills Wanted in West

Used machinery dealers on the West Coast are actively searching for large lathes, boring mills, and presses.

Most of the sellers are confident 1959 will be a good year for used machinery.

■ West Coast used machinery dealers need big lathes, boring mills, and presses. They're scouring the Midwest and East to find them.

Missile development work is behind the activity. "It isn't a big number of machines we're after. But they're big ticket items. And they just aren't around the Los Angeles, San Francisco, or Seattle markets," says a major southern California dealer.

What's Wanted—Here's what's needed: Lathes with a 5 ft to 10 ft swing, and 12-ft-and-up centers; boring mills with 14-ft-and-up swing; and a few big presses in the 750-ton-and-up class.

Business among northern California used machinery dealers ranges from fair to excellent—depending on the dealer's optimism.

A final quarter pickup raised the total year's volume sharply from the doldrums suffered in the early months of 1958.

Big Items in Demand—One dealer, who terms his business tops, says the strong demand is in late model machines. But he's having trouble getting them. The tightest pinch: Large boring mills and large lathes. Tracer and duplicating equipment, used largely in missile work, brings quick sales and good prices, too, he adds.

General purpose tools, another

dealer reports, are not doing too well. Used machinery, more than 10 or 15 years old, is moving slower than ever—and prices on such equipment tend to be weak.

Still another dealer, stressing the same point, says "older stuff is getting cheaper fast." He, too, emphasizes the shortage of late model tools and the better movers. Foreign equipment, dealers note, continues popular among many buyers. Prices are more competitive than ever with good used machinery. And parts are easier to get. Net result: Increased acceptance for foreign tools in the U. S. market.

Opinions on '58—According to northern California dealers checked by The IRON AGE, 1958 will wind up anywhere from a "little down" from 1957 to up as much as "25 or 30 pct."

Though the dealers vary on the volume range for 1958, none are lacking in optimism for 1959.

With a wave of missile-inspired optimism, the Seattle used machinery market steadily firmed up over the past several weeks.

The unsteadiness of the summer months gave way to a buying wave that heightened demand for all forms of machinery, new and used.

Seattle Buyers Active—Reports one dealer, "Ordinarily, Seattle buyers will accept only high-quality, low-priced items, and then only in limited quantities. Today, they're accepting many pieces of equipment that they wouldn't have four months ago."

Demand centers around all types of precision equipment, rather than the more standard heavier machines.

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BENDING ROLLS

6" x 3/4" Hertsch Initial Type
12" x 3/4" Hilles & Jones Pyramid Type
15" x 3/16" Hertsch Initial Type—NEW
BRAKE—LEAF TYPE
12" x 3/4" Dreis & Krump #226

BRAKE—PRESS TYPE

12" x 3/4" Airtherm Model No. 3814

CHARGING MACHINE

Salem Brosius 4-wheel Furnace Charging Machine.
Charge Boxes 24" x 33" x 76 Inside Measurement

CRANES—OVERHEAD ELECTRIC TRAVELING

7 1/2 ton P&H	60' Span 230 Volt D.C.
8 ton P&H	55' Span 230/3/60
10 ton P&H	50' Span 230 Volt D.C.
10 ton P&H	50' Span 230 Volt D.C.
10 ton Milwaukee	57' Span 230 Volt D.C.
10 ton Shaw	48' Span 230 Volt D.C.
10 ton Whiting	75' Span 230/3/60 A.C.
10 ton Shaw	120' Span 230 Volt D.C.
15 ton P&H	50' Span 230 Volt D.C.
15 ton Northern	54' Span 230 Volt D.C.
15 ton Shepard Niles	56' Span 230 Volt D.C.
15 ton N-B-P	100' Span 230/3/60 A.C.
120 ton Shepard Niles	77' Span 230/3/60

DIEING MACHINE

50 ton Henry & Wright, 4 1/2" Stroke

DRAW BENCHES

3000 lb. Draw Bench, 20 ft. Pull
7000 lb. Draw Bench, 50 ft. Pull—New 1956
10,000 lb. Draw Bench, 50 ft. Draw—LATE

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1" to 5" Acme, Ajax, National

HAMMERS—BOARD DROP—STEAM DROP—STEAM

FORGING 800 lb. to 12,000 lb. Incl.

LEVELERS—ROLLER

12" Waterbury Parrel 9 Rolls 6" Dia.
54" McKay 17 Rolls 4 1/2" dia.
60" McKay 17 Rolls 3 1/2" Dia.
60" Aetna Standard, 17 Rolls 4 1/2" dia.
72" McKay 15 Rolls 4 1/2" dia.
84" Bliss 17 Rolls 5 1/2" dia.

PLATE DUPLICATOR

#12 Thomas 150 ton Copy. Handles Plate 5' x 16'
PRESSES—HYDRAULIC
300 ton Southwark Bed 28" x 28" Stroke 25"
500 ton Watson Stillman Piercing Press 48" x 72"
500 ton HPM Fastraverse, Bed 36" x 36"
600 ton Blinbore, Platen 48 x 48", 13 Stroke
1000 ton HPM Fastraverse, Bed 48" x 72", 36" Stroke
4500 ton H-L-H Bed 68 x 68", Stroke 40"

32" x 3/4" BALDWIN
PYRAMID TYPE BENDING ROLL
Air Activated Drop End
2 Motors—60 & 40 H.P. A.C.
NEW 1942

PUNCH—BEAM

#14 Thomas Guillotine Type 225 ton Copy.
With 50 ft. Spacing Tables

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6" x 5" Torrington Flat Wire Mill Line
2 1/2" x 9" x 9" 4-High Strip Mill
3 1/2" x 7" Six Roll Cluster Mill
10" x 14" Single Stand Two High
10" x 16" Single Stand Two High
12" x 12" Single Stand Two High
12" x 16" Single Stand Two High
16" x 24" Single Stand Two High
20" x 36" Single Stand Two High

ROLLS—FORMING

6 Stand Dahlstrom #450-6 for stock to 4 1/2" wide
up to 11 Ga.

ROLLS—PLATE STRAIGHTENERS

100 Hertsch Seven Rolls 9" Dia.
110" Hilles & Jones 6 Rolls 12" Dia.
72" Niles 7 Rolls 9" Dia. Motor Driven

SHEARS—SQUARING

6' x 14 Ga. Edwards, Motor Drive—LATE
8' x 1 1/4" Niagara No. 8E
10' x 3/16" Dreis & Krump
10' x 1/4" Cincinnati
10' x 3/4" Niagara

SLITTERS

30" Yoder M-2-1/2 Slitting Line
36" Yoder, 1 1/2" Dia. Arbor

STRAIGHTENERS

Torrington #1734 12-Roll, Copy, 1 1/2" Rd. 1-9/16"
#4-12 1/2" Littell Indexing, Feeding & Straightening
Machine, Capacity .062" x 12" in SAE 1010 Steel

SWAGING MACHINES

#1A Standard 2-Die, Copy, 2 1/2" Tube
#6A Fens Capacity 3 1/2" Tube 1 1/4" Solid
10" Die Length Hydraulic Feed

TESTING MACHINES

20,000 lb. Baldwin Univ. Hydraulic
50,000 lb. Baldwin Southwark Compression
60,000 lb. Olsen Univ. Hydraulic
100,000 lb. Olsen Universal Beam Type
500,000 lb. Olsen Super DeLuxe Compression

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1 1/2" Tube Reducer for steel
2 1/2" Tube Reducer for aluminum

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Type B Morgan 4-Block Copy. #5 Rod down

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MESTA TANDEM MILL—5 STAND—4 HI

Complete with uncoiler—recoiler—M.G. set—800 H.P. drive ea. stand
Work Rolls 18 1/8" x 42" and Back Up Rolls 49 1/2" x 42".

TWO STAND TANDEM MILL—2 HI

500 H.P. drive motor on #1 stand—#2 stand full reversing with 400 H.P. motor.
Complete with 700 K.W.—M.G. set
Now reducing .400 thick brass slabs to 1/8"
Roll Size 22" Dia. x 36".

SKIN PASS MILL—4 HI

Back up rolls 30" dia. x 32" face—work rolls 15 1/4" dia. x 31" face
500 H.P. drive motor, winding reel with motor 300 HP, Coiler with 50 HP motor, M.G. sets, drag
generators, etc.

• Mesta Uncoiler • Coil Upender & Conveyor • Hot Strip Pickle Line • Batch Pickle Machine
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Qu.	H.P.	Make	Type	Volts	Speed
1	1750	G.E.	M-578BS	4800	1800
1	1500	G.E.	MT	6600	1187
1	800	Whse.	CW	550	1776
1	700	A.C.	CW	2300	350
1	800	Whse.	CW-4-52D-15	440	1778
1	500	G.E.	MT-412	2300	459
1	500	Whse.	CW	350	350
1	350	Cr. Wh.	Size 718R	208/416	1765
1	350	G.E.	IM-17A	230/440	730
1	350	Whse.	CW-10-39C-15	440	730
1	250	G.E.	IM-16	230/440	875
1	250	G.E.	MTS63Y	220/440	875
1	250	A.C.	Any	550	600
1	250	G.E.	TF-13B	220	1900
1	250	Cr. Wh.	Size 29Q	2300	350
1	250	G.E.	MT-424Y	4000	257
1	200	G.E.	SR-26QB	440	505
1	200	Cr. Wh.	CW-874D	230/440	885
1	200	G.E.	IM-17A	2300	435
1	100	A.C.		440	895

Qu.	H.P.	Make	Type	Volts	Speed
1	800	G.E.	KT-572	2300	1180
1	500	G.E.	FT-559AY	2300	3600
2	500	Whse.	CW-1115	2300	863/445
4	500	Whse.	CS-1216	2300	500
1	400	Whse.	CS-7151-		
1	300	Whse.	CS-1092	6600/4000	3585
3	200	Whse.	CS-8558	2300/440	800
1	150	G.E.	D.P.	220/440	1750
1	150	Whse.	CS	2300	875
1	125	Whse.	CS-764C	230/440	1160
3	100	Whse.	CS-7690	2300/440	1100

Qu.	H.P.	Make	Type	Volts	Speed
1	6000	G.E.	ATI 9	2200/6600	600
1	3500	G.E.	TS 1.0	1600/2300/4000	360
1	2500	Whse.	RP.F.	2300	720
1	2000	G.E.	ATI	2300	900
1	1750	G.E.	ATI	2300	3600
1	1750	G.E.	TS	2300/4000	900
1	1350	G.E.	ATI	2300/1200	600
1	700	G.E.	TS .8P.F.	2200	1200
1	300	G.E.	IM	440/2300	580
1	350	Whse.	1.0P.F.	440	900
2	350	G.E.	ATI 1.0P.F.	2300	150
1	325	G.E.	ATI 1.0P.F.	440	1800

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No. 2 Avey, m.d.
No. 1B Edlund, m.d., new
No. 4BM Fostick, single spindle, H.S., m.d.
No. 4MS Leland & Gifford H.S., 4 spindle A.C., m.d.
1 Spindle No. 2MAG Avey H.S. Type B, m.d., 7 1/2" overhang 1943
No. 2B-8" H.D. Edlund, H.P., m.d.
2 spindle Atlas Bench Type, 1942
2 spindle Allen, belted m.d., 8" overhang
2 spindle No. 2 Avey H.S., belted m.d.
2 spindle No. 2BMA, 1 Avey Production Type, m.d.
2 spindle No. 3 MAG Avey H.S., m.d.
2 spindle No. 2 Leland & Gifford H.S., 8" overhang, m.d.
2 spindle Leland-Gifford H.S. Hydraulic Type, m.d.
No. 2LMS Leland-Gifford single spindle, H.S., m.d.
3 spindle No. 2 Avey, belted, m.d.
3 spindle No. 3 Morse Taper, Foot-Burt "Sipp" H.S., m.d.

3 spindle No. 2B-8 Edlund, H.S., m.d.
3 spindle No. 2MA 6 Avey H.S., m.d.
3 spindle Leland-Gifford #21 LMS—H.S., m.d., late
3 spindle Leland-Gifford H.S., m.d.
4 spindle Leland-Gifford, m.d., on each spindle
4 spindle No. 15 Buffalo Bench Type
4 spindle Allen H.S., belt drive
4 spindle No. 1/2 MAB Avey, m.d., H.S.
4 spindle Demco H.S., individual m.d.
4 spindle No. 2BMA-6 Avey H.S., m.d.
5 spindle Allen H.S., belt drive
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No. 2 taper
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6 spindle No. 1/2 Avey MAB Avey H.S., m.d.

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100 CFM	125 psi 6 x 7 1/2 in. or Worth.
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268 CFM	500 psi 10-4 1/4 x 10 in.
465 CFM	100 psi 12 x 11 in.
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3652 CFM	110 psi. 33-20 1/2 x 24 Log. PRE2
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Max. allowable Temperature 650°
Shell Thickness 0.96

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2 Stage, 300 PSI
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Vacuum 5.0 H2O
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15 HP Capacity 8000 C.F.H.

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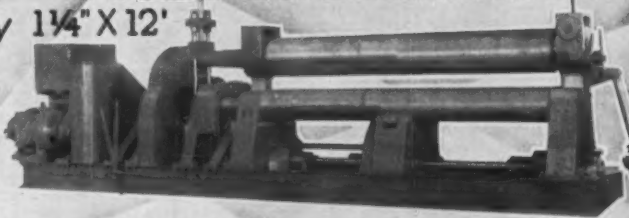
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A *Abell-Howe Co. 119 Acme-Newport Steel Co. 105 Acme Steel Co. 41 Aetna-Standard Engineering Co., The 33 Air Reduction Sales Co. Div. of Air Reduction Co., Inc. 36 *Alco Products, Inc. 28 & 29 *Allegheny Ludlum Steel Corp. Carmet Div. 5 American Air Compressor Corp. 142 American Bridge, Division United States Steel Corp. 34 & 35 American Gas Association 26 *American Gas Furnace Co. 77 American Steel & Wire Div., United States Steel Corp. 34 & 35 Arcos Corp. 116 & 117 *Armco Steel Corp. 6 Arthur Equipment Co. 143 Associated Spring Corp. 82	*Deis & Krump Mfg. Co. 159 Dunbar Bros. Co. Div. Associated Spring Corp. 82 E Eastern Machinery Co., The 142 Easton Car & Construction Co. 83 *Euclid Crane & Hoist Co., The 138 F *Farrel-Birmingham Co., Inc. 62 Foote Mineral Co. 58 Frank, M. K. 141 G Gardner Machine Co. 27 General Steel Castings Corp., National Roll & Foundry Div. 12 Gerrard Steel Strapping Div., U. S. Steel Corp. 34 & 35 Gibson, Wm. D. Co., Div. Associated Spring Corp. 82 *Gleason Works 57 Goodman Electric Machinery Co. 141 Goss & DeLew Machine Co. 127 *Greenlee Bros. & Co. 74 Greist Manufacturing Co., The 144	M Levinson Steel Co., The 43 *Lodge & Shipley Co. 70 MacCabe, T. B. Co. 140 *Magnetthermic Corp. 22 Marshall Railway Equip. Corp. 142 Meriwether, George M., Inc. 142 Michigan Tool Co. 42 Miles Machinery Co. 142 Morrison Railway Supply Corp. 142 Mundt, Chas. & Sons 123 Murphy Machinery, Inc. 142 & 144 N National Business Bourse, Inc. 145 National Machinery Exchange 142 National Roll & Foundry Div., General Steel Castings Corp. 12 National-Standard Co. 72 National Tube Co., United States Steel Corp. 34, 35, 85 & 87 New England Pressed Steel Co. 145 New Jersey Zinc Co., The 48 Nicholson File Co. 10 Norton Company, Abrasive Grain Div. 88	Somers Brass Co., Inc. 11 Siamco, Inc. 127 *Steelweld Div., The Cleveland Crane & Engineering Co. 44 T Tennessee Coal & Iron Div., United States Steel Corp. 34, 35 Texas Company, The 37, 38, 39 & 40 *Thermo Electric Co., Inc. 125 Timken Roller Bearing Co., The 48 Tractor & Equipment Co. 141 U United Engineering & Foundry Co. 113 United States Steel Corp. 34, 35, 86 & 87 United States Steel Export Co. 34, 35, 86 & 87 United States Steel Homes Div., U. S. Steel Corp. 34 & 35 United States Steel Products Div., U. S. Steel Corp. 34 & 35 United States Steel Supply Div., United States Steel Corp. 34, 35, 86 & 87 U. S. Steel Wire Spring Co., The 127 Universal Atlas Cement Co. 34, 35 Universal Machinery & Equipment Co. 144
B Baldt Anchor, Chain & Forge Div. 145 *Baldwin-Lima-Hamilton Corp., Hamilton Division 21 Barnes, Wallace Co. Div. Associated Spring Corp. 82 Barnes, Wallace Steel Div., Associated Spring Corp. 82 Barnes-Gibson-Raymond, Inc. Div. Associated Spring Corp. 82 Bearings, Inc. 107 Belyea Co., Inc. 142 *Benchmark Manufacturing Co. 123 Bertsch & Company 146 *Bethlehem Steel Co. I, 17, 18, 19 & 20 Bliss, E. W., Co., Press Division Back Cover Boynton, A. J., & Co. 127 *Bridgeport Brass Co. 23	H *Hamilton Division, Baldwin-Lima-Hamilton Corporation 21 Hardinge Mfg. Co. 144 Henry, A. T., & Company, Inc. 141 Hevi-Duty Electric Company 16 Huebel Mfg. Co., Inc. 145 Hughes, Arnold Co. 141, 143-145 Hyatt Bearings Div., General Motors Corp. 85 Hyman, Joseph & Sons 142	O Ohio Steel Foundry Co. 78 Oil Well Supply Div., U. S. Steel Corp. 34 & 35 Olson Manufacturing Co. 144 Ornitz Equipment Corp. 143 P Parker Steel Co. 145 *Pennsylvania Flexible Metallic Tubing Co., Inc. 13 Philadelphia Gear Corp. 46 Pittsburgh Engineering & Machine Division of Pittsburgh Steel Foundry Corporation 4 *Progressive Mfg. Co., The Div. of The Torrington Co. 123 Purdy Company, The 143	V Virginia Gear & Machine Co. 45 W Wallack Bros. 145 Ward Steel Co. 110 *Watson-Stillman Press Division Farrel-Birmingham Co., Inc. 129 Weatherly Foundry & Mfg. Co. 144 *Webb Corp., The, Reed Equipment Division 80 Weiss, B. M. Co. 143 Weiss Steel Co., Inc. 145 Wheland Co., The 110 Whisler Equipment Co. 144 Wickwire Spencer Steel Div., The Colorado Fuel & Iron Corp. 127 Wilcox Forging Corp. 144 Williams Steel Supply 145 Winston Machinery Co., Inc. 143
C Carco Industries, Inc. 145 *Carmet Div., Allegheny Ludlum Steel Corp. 5 Chambersburg Engineering Co. 32 *Cleveland Crane & Engineering Co., The Steelweld Machinery Div. 44 Climax Molybdenum Co. 60 Colorado Fuel & Iron Corp., The Wickwire Spencer Steel Div. 127 Columbia-Geneva Steel Div., United States Steel Corp. 34, 35, 86 & 87 Consolidated Western Steel Div., U. S. Steel Corp. 34, 35 Consumers Steel & Supply Co. 145 Continental Screw Co. 45 Copper & Brass Research Association 108 & 109 *Copperweld Steel Co., Aristoloy Steel Division, Inside Front Cover Crucible Steel Co. of America 30 & 31 Cyclone Fence Div., U. S. Steel Corp. 34 & 35	I Iron & Steel Products, Inc. 140 *Irving Subway Grating Co., Inc. 106 J Jones & Laughlin Steel Corporation 55 K Kaiser Aluminum & Chemical Sales, Inc., Kaiser Chemical Division 14 Keystone Forging Company 144 L Lafayette Machinery Co. 142 Lang Machinery Co., Inc. 142 *LaSalle Steel Co. 114	R Racine Industries 143 Raymond Manufacturing Co., Div. Associated Spring Corp. 82 Reliance Electric & Engineering Co. Inside Back Cover *Republic Steel Corp. 24 & 25 Roebbing's, John A., Sons, Corp. 45 Rohlock, Inc. 84 Rosedale Foundry & Machine Co. 144 Ryerson, Jos. T., & Son, Inc. 120	Y Youngstown Sheet & Tube Co., The 8 CLASSIFIED SECTION Clearing House 145-144 Contract Manufacturing 144-145 Employment Exchange 145 Equipment & Materials Wanted 145
D Donahue Steel Products Co. 145 *Dravo Corporation 81		S Sieburg Industries, Inc. 145 Smith, Thomas, Co. 144	

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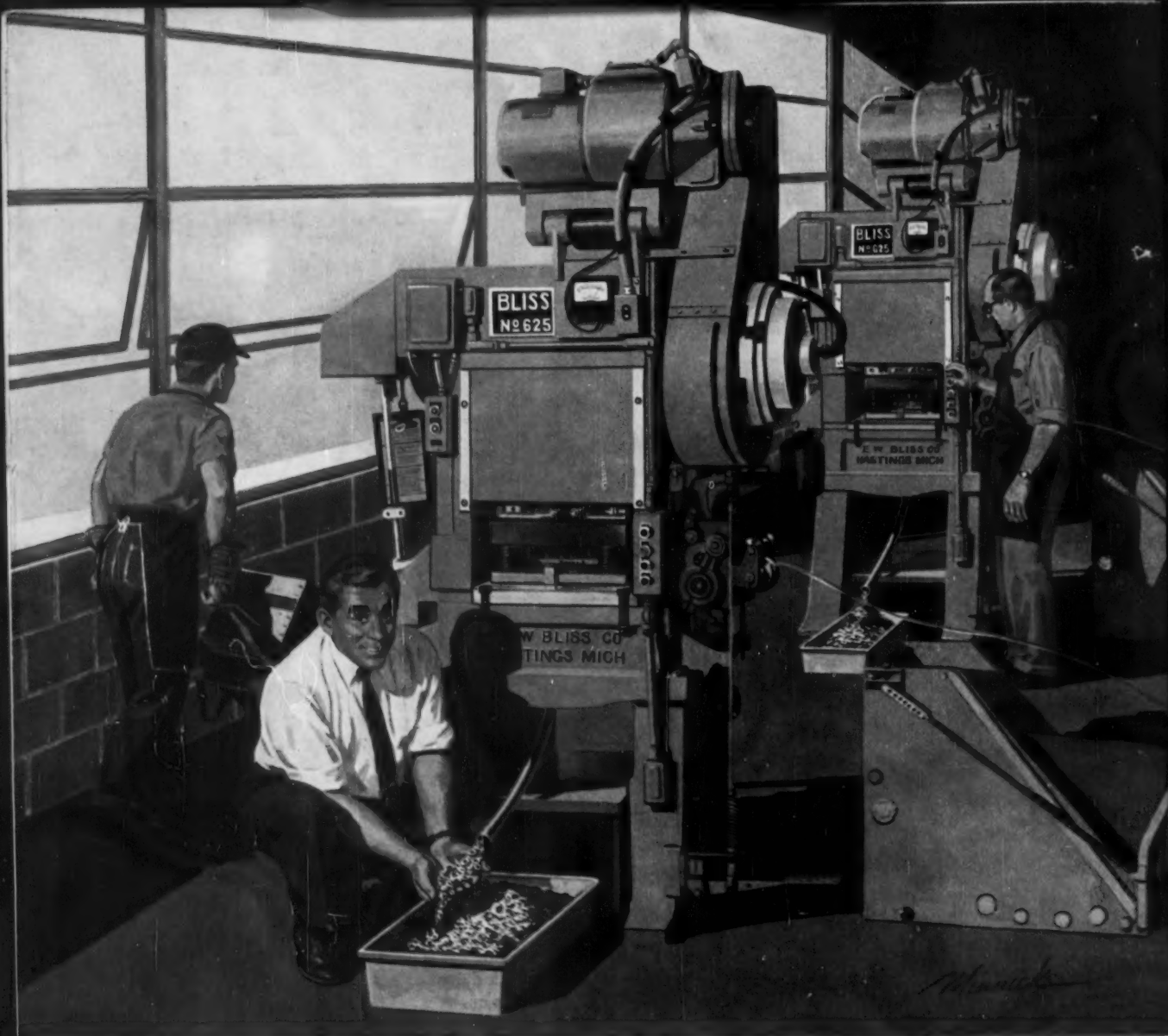
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